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ABSTRACT

Presented is the annual report of the Department of Audiology and Education of the Deaf at the University of Manchester (England) which includes five papers given at a conference of heads (administrators) of schools for the deaf and partially hearing. Listed are the academic staff, courses of the department, staff activities, and research and publications of staff members. Provided are summaries of 10 dissertations given by students receiving the diploma in audiology in 1972. Brief descriptions of the various programs offered by the department are included and listed are two films and two video tapes available on loan. The agenda of the 2-day conference which focused on school management, hearing aids, and the teaching of reading is provided. In the first paper, heads of schools are encouraged to follow a systematic decision making process in coping with management problems. The second paper reviews the nature of special school management in a historical context. A chart lists the responsibilities of all school staff at one school for the deaf. Considered in the third paper are factors affecting the choice of hearing aids and their efficiency in use. The fourth paper reports on a survey of hearing aids used by 5606 hearing impaired children. Reviewed in the fifth paper is research on the teaching of reading to deaf children. (DB)

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Annual Report

Department of Audiology and Education of the Deaf

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DEPARTMENT OF AUDIOLOGY AND EDUCATION OF THE DEAF

UNIVERSITY OF MANCHESTER

ANNUAL REPORT

VOLUME 4.

1973

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ACADEMIC STAFF

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I. G. Taylor, M.D., M.R.C.P., D.P.H., (Manchester), F.C.S.T. (Hon).

Reader in Audiology and Education of the Deaf,
T. J. Watson, M.C., M.A., Ph.D. (Edinburgh).

Senior Lecturers in Audiology,
J. E. J. John, B.Sc. (Wales).
H. L. Owrid, M.A., Ph.D. (Manchester), F.L.A.

Lecturers in the Education of the Deaf,
G. W. Redgate, B.A., M.Ed., Dip.Ed. (Manchester).
Jean N. Howarth, M.A. (Manchester).
Jean Palmer, B.A. (London).
J. G. McClelland, B.Sc. (Econ.), M.A., Dip.Ed. (Belfast)
Susan A. Lugton, B.A. (Leicester)
C. A. Powell, B.A. Dp.Audiol. (Manchester)
W. D. Hine, M.A. (Oxford and Liverpool)
Julie E. Gemmill, M.A. (St. Andrews)

Lecturers in Audiology,
Vivienne J. Brasier, B.A. (Oxford), M.Sc., Dp.Adv.Stud.Sc. (Manchester)
Keith Chiveralls, B.Sc. (Reading), M.Sc. (Birmingham).

Lecturers in Parent Guidance,
G. B. Campbell, M.Ed., Dp.Audiol. (Manchester), F.R.S.H.
Terence Morris, Dp.Audiol. (Manchester).
Barry McCormick, B.Sc. (London), Dp. Audiol. (Manchester).

Lecturer in the Department,
L. A. Ives, M.Ed., Dp.Ed. Psych. (Manchester) Ac.Dip.Ed.
(London), A.B.Ps.S.

Lecturer in Phonetics,
R. B. Stewart, M.A., Dip.Phon. (Edinburgh).

Lecturer in Speech Pathology and Therapy,
Dorothy B. Byers Brown, M.C.S.T.

Lecturer in Experimental Psychology,
Ilse V. L. Kracke, M.Sc.,(London), Dip. Psych. (Brunswick).

Honorary Special Lecturer in Architectural Acoustics:
Herbert Thomas, L.R.I.B.A.

Honorary Lecturers in the Department,
J. C. Denmark, M. B., Ch.B. (Liverpool), D.P.M., (Manchester),
M.R.C.S., L.R.C.P., M.R.C.Psych.
T. H. Whitaker, M.B., Ch.B. (Manchester), LL.B. (London).

Honorary Consulting Otologist,
Kenneth Harrison, M.D., (Manchester), D.L.O., F.R.C.S.

Senior Research Associates,
G. A. W. Sharrard, M.A., B.M., B.Ch. (Oxford), D.L.O.,
Alan Huntington, B.A. (Manchester)

Research Associate,
Christine M. Cheney, Cert. T. Deaf (Manchester)

Research Assistant,
Melisande J. P. Sykes, B.A. (London)

Senior Experimental Officer,
Arthur Kettlety, C.Eng., M.I.E.E., M.I.E.R.E.

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COURSES IN THE DEPARTMENT

Summary of students attending :	Session 1971-72	Session 1972-73
Certificate for Teachers of the Deaf	59	57
(Teachers Certificate taken with above)	14	20
Diploma in Audiology	10	3
Diploma in Advanced Study in Education of the Deaf	5	2
B.Ed. (4 year, 1st degree course)	8 + 7 + 9 + 11	7 + 9 + 11 + 10
Diploma in Advanced Study in Education	3	1
M.Ed. (part time)	9	5
M.Sc.	3	2
Ph.D.	2	2
M.Ed. (Audiology)	-	8
M.Ed. (Education of the Deaf)	-	2

Higher degree

F. J. van Zyl, B.A. (Stellenbosch), Dip. Audiol. (Manchester) was awarded the degree of M.Sc. in November, 1971 as a result of his thesis entitled "An Evaluation of Binaural Summation Tests".

Short Courses - Session 1971-72

The following short courses were held during the Easter and Summer vacations :

Medical Officers' Course, 20-24th March, 1972
Audiometry, 20-24th March, 1972
Partially Hearing Children in Ordinary Schools, 17-21 April, 1972
Ewing Foundation Speech Course, 3 - 7 July, 1972.
Health Visitors' Course, 3 - 7 July, 1972
Investigation and Assessment of Children with Delayed Speech, 3-7 July, 1972.
Language and Communication, 10-14 July 1972.
Audiological and Psychological Assessment of Hearing-Impaired Children, 10-14 July, 1972.
Ewing Foundation Speech Course, 11-15 September, 1972.

Staff

J. E. J. John, B.Sc. (Wales) was appointed Senior Lecturer in Audiology in lieu of his appointment as Lecturer in Audiology, from 1st October, 1971.

Keith Chiveralls, B.Sc. (Reading), M.Sc. (Birmingham) was appointed Lecturer in Audiology, from 1st October, 1971.

Barry McCormick, B.Sc. (London), Dip. Audiol. (Manchester) was appointed Lecturer in Parent Guidance, from 1st July, 1972.

H. L. Owrid, M.A., Ph.D. (Manchester) was appointed Senior Lecturer in Audiology in lieu of his appointment as Lecturer in Audiology, from 1st October, 1972.

Jane Weightman, B.A. (Liverpool) resigned her appointment as Research Assistant, from 31st October, 1971.

Ilse V. L. Kracke, M.Sc. (London), Dip. Psych. (Brunswick) was re-appointed as Lecturer in Experimental Psychology, from 1st October, 1972.

Staff Appointments as External Examiner, etc.

Mrs. D. B. Byers Brown has been appointed External Examiner in Speech Pathology and Therapeutics, Clinical, of the College of Speech Therapists.

Mr. R. B. Stewart has been appointed External Examiner in Phonetics of the College of Speech Therapists.

Dr. H. L. Owrid has been appointed External Examiner to the Diploma in Education of the Deaf and Partially Hearing Children of the University of London.

Mr. L. A. Ives, was appointed Course Tutor at the British Psychological Society's Summer School on the Assessment, Management and Therapy of the Handicapped, at the University of Kent.

Dr. J. C. Denmark, (Honorary Lecturer in the Department) was elected to the Membership of the Royal College of Psychiatrists.

Dr. T. J. Watson has been appointed External Examiner to the Diploma in Education of Deaf and Partially Hearing Children at Moray House College of Education, Edinburgh, for a further period of three years from October, 1972.

Mrs. D. B. Byers Brown continues to act as External Examiner for the M.Sc. in Human Communication, of Guy's Hospital Medical School in the University of London.

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Visits :

Professor Taylor was appointed University Representative at the XIth International Congress of Audiology held in Budapest in October, 1972. Other members of staff reading papers at the Congress were Dr. Owrid, Miss Brasier, Mr. Hine and Dr. Sharrard.

Dr. Watson opened a Conference on Extending the School Life of Handicapped Children, held at Keble College Oxford, in September, 1971.

Mr. Redgate attended a Conference of Tutors of Overseas Students held at the University of Hull, in March, 1972.

Mr. Redgate also visited Ghana in September, 1972 to attend a Seminar organised by the Commonwealth Society for the Deaf on Deafness in Africa, and held at the University of Ghana, Lagon. Mr. Redgate organised the Education Section of the Seminar and acted as Chairman of the Section.

Dr. Owrid visited the Wolfson Centre, London, attending the Reynell course on linguistic assessment of young normally hearing and hearing impaired children.

Dr. Sharrard attended the Congress on Interdisciplinary Investigations of the Brain held at Oxford from 11 - 13 April, 1972 and gave demonstrations of evoked response audiometric techniques.

Mr. G. W. Redgate visited Ghana in September, 1972 to lecture and to lead the Education Section of the Commonwealth Society for the Deaf Seminar held

Recent developments in the Department.

Full-time courses of one calendar year's duration leading to the award of the M.Ed. degree in Audiology and to the M. Ed. degree in Education of the Deaf, have been instituted since October, 1972.

In addition, a course in Clinical Audiology leading to the degree of M.Sc. in the Faculty of Medicine is to be available from October, 1973.

From October, 1973, the present B.Ed. Ordinary degree course will be replaced by a course leading to the degree of B.A. with Honours in Combined Studies.

Commencing in session 1973/74 it is hoped to be possible to offer a 12-week course for peripatetic teachers of the deaf in which emphasis will be placed on giving guidance to parents of pre-school age children.

RESEARCH AND PUBLICATIONS

Ewing Foundation

In addition to continuing work with the two groups of severely and profoundly deaf children at the Royal Schools for the Deaf, Cheadle Hulme and the School for the Deaf, The Mount, Stoke-on-Trent (described in previous reports) Mr. Huntington has begun some interesting research into the efficiency of inductance loop systems. With the help of Mr. G. Dunster, the Ewing Foundation Senior Technician, tests have been carried out in classrooms at Cheadle Hulme and in Birmingham. Further investigations are planned particularly with a view to evaluating the performance in looped classrooms of a range of commercial body-worn aids.

Miss Cheney's work in the two Midland schools continues to develop along the lines described in last year's Report and she has also been invited to assist with advice in fostering the development of oral communication at Royal Schools for the Deaf, Derby. She has organised a very successful course in simple audiology geared to the needs of acillary staff at Braidwood School.

Two refresher courses in Speech were provided by the Ewing Foundation and held in the Department of Audiology and Education of the Deaf in April and September, 1972.

In addition to financing the technical work of Mr. Dunster the Foundation has recently assisted in setting up a similar service in the Birmingham area by providing a vehicle and the technical equipment necessary for the carrying out of the work.

Screening Survey

Approximately 2000 children in schools for deaf and/or partially hearing children are being screened in order to obtain information about the probable incidence of dual and multiple handicaps. Seventy Local Education and Health Authorities have been invited to submit information about the incidence of hearing impaired children being educated in schools for the severely subnormal. Measures employed in the survey include tests of hearing; oral and written language tests; social adjustment ratings and questionnaires. Analysis of the results will lead to detailed studies of several sub-groups of additionally handicapped hearing impaired children. These further studies should produce information which will clarify the postion regarding the most effective regional provision for such pupils.

There has been an excellent response to this study and the analysis of returns is proceeding.

Severely Sub-Normal Hearing Impaired Children

The Department is collaborating with the Royal Schools for the Deaf in an advisory capacity in connection with a unit for SSN hearing impaired children which was opened in August, 1972. Mr. Ives is making longitudinal studies of the psycho-educational development of these children and Dr. Watson is assessing their development of communication. Assistance with audiological tests has been given by Dr. Sharrard and Miss Brasier.

Leverhulme Trustees

Further work by Dr. Sharrard into the use of the electro-encephalograph as an aid in the diagnosis and management of deaf children has been carried out during the past session. These have included: (i) the final tests in a series perfecting a scrambling technique in evoked response audiometry; an investigation of 20 normal newborn infants, each having an evoked response audiogram. These will be retested at 3 months and then at six-monthly intervals thereafter; (iii) the development and improvement of apparatus and technique with a method of testing the cochleagram where the potential of the acoustic nerve are directly averaged.

Programmed Reading Unit

Following the submission of the final report to the Department of Education and Science and the Scottish Education Department this has now been written up and is in the hands of the Manchester University Press for publication in book form.

Analysis of Defective Speech

Research has continued on the parametric analysis of deaf children's speech. Ten schools have now been visited and tape-recordings taken of the speech of more than 60 children.

At present an attempt is being made to describe the lipread pattern in parametric terms to determine its information-bearing capacity.

Binaural Location Tests

Longitudinal studies to see if there is any difference between two different types of ear level aid are still in progress.

Language Disordered Children

Joint studies of language disordered children were undertaken by Professor Taylor, Mrs. Byers Brown and Mr. Ives. Two detailed case studies were presented to the Conference entitled "Neurological Aspects of Language Delay and Disorder in Childhood", held at the Birmingham School of Speech Therapy in April, 1972.

Proposed Learning Aptitude Scale for Hearing Impaired Children

Some informal experimental work has been undertaken during 1972-73, largely with reference to generally sub-normal deaf children. It is hoped that the results of this work will be published in due course.

Language and Deafness

Dr. Owrid's research is in four areas of particular interest :-
(i) comprehension of grammar (ii) relationships between linguistic and educational attainments, especially reading; (iii) comparisons between impaired hearing and cultural deprivation as sources of educational handling; (iv) the remediation of linguistic handicap in children with relatively slight hearing impairment.

PUBLICATION AND PAPERS READ :

Vivienne J. Brasier : "Binaural Summation in Diagnosis." Paper presented to the British Society of Audiology, January, 1972.

Binaural Speech Discrimination". Paper read at the XIth International Congress in Audiology, Budapest, October, 1972.

Betty Byers Brown : "The Processes Involved in Language Acquisition". Paper read to the Interdisciplinary Symposium on Neuropsychological Aspects of Language Delays and Disorders in Children. Birmingham, April, 1972.

"Language Disorders in Children". Paper read to the Conference of the Association of Teachers of the Deaf, Brighton, April, 1972.

"The Nature and Treatment of Speech Disorders". Paper read to the Conference of the Association of Special Education, Huntingdon, May, 1972.

"The Significance of Speech Delays in Children". Paper read to the Conference of the College of Speech Therapists (Midland area), Nottingham, May, 1972.

"An Attempt to Facilitate Language Acquistion in a 4-Year Old Child". Paper presented at the 3rd International Congress of Applied Linguistics, Copenhagen, August, 1972.

G. B. Campbell : "The Professional Worker's Rôle in Parent Guidance". Paper read at the National Conference of the National College of Teachers of the Deaf, University of Sussex, April, 1972.

"The Pre-school Hearing-Impaired Child - Parent Guidance and Home Training". Paper read to Worcestershire County Council, Health Committee course, April, 1972.

W. D. Hine : "Hearing Impairment in Cerebral Palsy - Educational and Psychological Aspects". Paper read to School Health Service Group, Society of Medical Officers of Health, 25th May, 1972.

"A Study of Hearing Losses in Schools for the Deaf and Partially Hearing in Great Britain". Paper read to XIth International Congress in Audiology, Budapest, October, 1972.

L. A. Ives : "The Psychology of Hearing Impaired Children and Adults". Monograph - Association of Educational Psychologists. (In the Press).

"Stresses in Deaf and Partially Hearing Children". Chapter in "Stresses in Handicapped Children". University of London Press. (In the press).

L. A. Ives (continued) ..

"Infantile Autism : Concepts, Characteristics and Treatment". Ed. M. Rutter, London Churchill Livingstone. Abstract, Brit. J. Dis. Commun. (In the Press).

"Developmental and Time Variables in the Immediate Memory of the Hearing-Impaired". Brit. J. Psychol. (with D. E. Bond). (In the press).

"The Social- Emotional Adjustment of Hearing-Impaired Children". Teacher of the Deaf, LXX, 123-136. (With K. Meredith).

"Case Studies of Two Language Disordered Children". Paper read to Conference on Neuropsychological Aspects of Language Delays and Disorders in Children, Birmingham, April, 1972.

A. Kettlety :

"The Visual Display of Speech Intensity". Teacher of the Deaf, Vol. 70, No. 411, 1972.

"The Averaging of Evoked Response Signals". Proceedings Electrophysiol. Technol Assoc. Vol. 19, No. 1, 1972.

"Electroacoustic Impedance Meter". Lecture/demonstration to Electrophysiological Technologists Association, Withington Hospital, June, 1972.

T. Morris :

"Guidance to Parents of Children of all ages". Paper read to Warwickshire Education Committee Parents' Meeting.

"The Value of Impedance Bridge Testing in the Diagnosis of Hearing-Impairment in Young Children". Paper read to Manchester Paediatric Club.

"The Correlation between Free Field Tests of Hearing and Pure Tone Audiometry". Paper read to British Society of Audiology.

H. L. Owrid :

"Studies in Manual Communication with Hearing-Impaired Children". Volta Review, Vol. 73, No. 7, October, 1971.

"Hearing Impairment and Verbal Retardation : Children in Normal Schools". Proc. Int. Cong. Ed. Deaf, Stockholm, 1970, Vol. 1. 1972.

"Education and Communication". Volta Review, Vol. 74, No. 4, April, 1972.

"Impaired Hearing and Knowledge of Syntax : a Study of Young Children". Paper read to XIth International Congress in Audiology, Budapest, October, 1972.

C. A. Powell :

"The Use of Tape Recorders with Hearing Impaired Children". Paper read to British Society of Audiology (Northern Branch), March, 1972.

"Aids to Hearing". Paper read to R.N.I.D. (Leicester Branch), March, 1972.

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G. W. Redgate : "The Teaching of Reading to Deaf Children". Manchester University Press. (In the Press).

"Research and the Teaching of Reading". Proc. Int. Cong. Ed. Deaf, Stockholm, 1970, Vol. 2, 1972.

"Manchester University and the Training of Teachers of the Deaf for Service in Commonwealth Countries". Commonwealth Society for the Deaf Journal, 1972.

"Educational Developments in the United Kingdom and their relevance to Africa". Paper read to the Seminar on Deafness in Africa, University of Ghana, Specember 1972.

G. A. W. Sharrard: "Evoked Response Audiometery". Paper read to Audiology Course, Salford University, February, 1972.

"Evoked Response Audiometery". Paper read to E.E.G. Society, London, February, 1972.

"The Use of a Frequency Scrambling Technique in Evoked Response Audiometry". Paper read to XIth International Congress in Audiology, Budapest, October, 1972.

I. G. Taylor : "Audiometry". Chapter in Biomedical Technology in Hospital Diagnosis. (Editors Elder and Neill). Pergamon Press Ltd., London, 1972.

"The Future of Audiology in the Hospital Service". Paper read to Section of Otology, Royal Society of Medicine, February, 1972.

"The Child Audiology Clinic". Paper read to the British Society of Audiology, London April, 1972.

T. J. Watson : "Some Developments in the Education of Deaf Children in the 20th Century". Paper read to National Deaf Children's Society (W. Cheshire Branch), December, 1971.

DISSERTATIONS

DIPLOMA IN AUDIOLOGY

Summaries of the dissertations presented in 1972 have been made by the students concerned and are given in the following pages.

Copies of dissertations are retained in the Departmental Library of the Department of Audiology and Education of the Deaf.

H. L. OWRID
Tutor to the Diploma Course
in Audiology.

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DUTHIE, J. 1972.

A review of the causation of deafness in children attending the Manchester University pre-school guidance clinic.

Supervisor: I.G. Taylor.

The general approach to the classification of the aetiology in childhood deafness is considered anent the difficulties of the collection of data and the identification of cause.

The special vulnerability of the auditory system is discussed in relation to factors in phylogenetic and embrological development and to points of anatomy and physiology.

A series of case histories is studied and grouped according to the principal attributable causal factor.

The congenital group of childhood deafness is studied more closely in respect of the mechanism of causation in the principal groups; and the development of knowledge relating to pathology is traced in the published literature.

FITZSIMONS, R. 1972.

The measurement of the stapedius muscle reflex action in normal subjects.

Supervisors: I.G. Taylor
K. Chiveralls

The investigation involves the measurement of two aspects of the stapedius muscle reflex action in subjects who were ascertained as being within the limits of normality as verified by pure tone and impedance bridge measurement of middle ear function. The subjects were in the age range 18 to 22 years.

The two aspects of reflex activity examined were:

(1) the threshold level of the reflex action, and
(2) the ability of the reflex action to sustain itself during prolonged stimulation.

The prime objective was to establish the norm for the decay time of the reflex action.

Using standard electro-acoustic impedance bridge equipment the subjects were stimulated at supra-threshold levels in the mid frequency range for a prolonged period. The amplitude of the reflex response was plotted graphically and the decrease in amplitude quantified in relation to the duration of stimulus.

The investigation results are given as reflex threshold levels and reflex decay times for the frequencies: 500Hz; 1000Hz; 2000Hz; 4000Hz. The results show a close relationship between decay time and frequency as revealed by the decreasing stability of the reflex action at the higher frequencies.

LAMBERT, SALLY D. 1972

A critical evaluation of the diagnostic value of impedance bridge testing in the differential diagnosis of hearing impairment in young children.

Supervisor: T. Morris

The dissertation aims to show in what ways impedance audiometry, can contribute to the more accurate diagnosis of hearing impairments in young children. The history and development of impedance audiometry is described, and the relevant research stated and discussed. Impedance audiometry is then evaluated in chart form, with other conventional tests of hearing, against the criteria sought after when diagnosing hearing impairments.

The chart shows that certain areas of diagnosis are better covered than others, and that impedance audiometry has much to offer in ascertaining the nature and cause of the hearing loss, and also in contributing information about the hearing levels of the 'non-co-operating' child.

As a result of the chart evaluation, certain hypotheses are put forward and examined in relation to eight specific cases, an examination of the impedance measurements of thirty two severely deaf children, and a survey of one hundred children, who had attended Manchester University Audiology clinic.

LEITH, CATHERINE 1972

A pilot study of acoustic impedance as a screening test of hearing.

Supervisor: J.E.J. John.

This pilot study sets out to investigate the postulation that the use of acoustic impedance measurements and a single frequency 25 dB screen, would be a more efficient, more simple, and less time-consuming means of screening for hearing loss in schools, than the conventional pure tone sweep test.

Forty Manchester school children were examined by acoustic impedance and puretone audiometry. Each child was tested by both methods on the same day to elminate the possibility of any new pathological condition developing between the tests which would nullify comparison of the sets of results.

The findings indicated that the ears failing by acoustic impedance and pure tone screening did not show good agreement. A larger percentage of ears were failed by acoustic impedance than by the pure tone sweep. Some ears failed by acoustic impedance only, and a smaller number failed by pure tone screening only. Some failed by both methods.

From these findings the conclusion was drawn that the tests were measuring different aural functions which are probably complementary, i.e. acoustic impedance measuring middle ear function, and pure tone audiometry measuring hearing acuity. Each test had advantages and disadvantages relative to its use and each should be used to test the function appropriate to it.

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McCORMICK, B. 1972.

The delayed auditory feedback and speech Stenger tests.

Supervisors: I.G. Taylor
K. Chiveralls

This study looks at two tests that have been advocated for the detection of malingering and psychogenic deafness. The writer points out that no audiometric test can distinguish between malingering and psychogenic deafness.

When subjected to Delayed Auditory Feedback (D.A.F.) various changes in a person's speech characteristics can be observed e.g. stuttering, slurring and change in rhythm, omission of sound, change in the rate of speaking, change in voice intensity.

The writer found that the change in voice intensity provided the most consistent measure of the effects of D.A.F., and could best be observed at a delay time of $\frac{2}{3}$ second (10 subjects were tested at delay times of $\frac{2}{3}$, $\frac{1}{3}$ & $\frac{1}{6}$ second and then a further 15 at only $\frac{2}{3}$ sec.)

The speech Stenger test is based on the principle that if the two ears of a normally hearing person are stimulated simultaneously by the same signal, differing only in intensity, and if the difference in intensity is sufficiently great, then the sound will be referred to the ear in which the intensity is greatest and the subject will be unaware of any stimulation in the ear to which the lesser stimulus is presented.

The writer found that the excess level required for the sound to be referred to one ear only varied for different subjects, but in all cases it was between 5 and 15 dB (mean approx.9 dB).

MARSTON, V.R. 1972.

An investigation into the social and emotional adjustment of children attending a residential school for the deaf.

Supervisor: L.A. Ives

1. The social and emotional development of the normally hearing child is outlined to act as a model to illustrate the pattern of normal development.

2. The causes and symptoms of deviation from the normal developmental pattern are examined to act as a framework of reference for the hearing impaired child.

3. The use of an adaptation of the Stott's Adjustment Pointer Questionnaire as a screening device is examined.

4. A group of 91 hearing impaired children aged 7 - 16 years attending a residential school for the deaf is screened with the questionnaire and the results examined.

5. A selected group of children, who scored adversely on the questionnaire, are examined in depth and case profiles prepared.

6. The development and adequacy of guidance and psychological assessment facilities for the normally hearing and the hearing impaired are discussed.

7. Suggestionsare made for the provision of extensions to the existing assessment facilities.

NULLIAH, G.K.

1972.

Speech and masking.

Supervisor: V. Brasier.

Part one - Speech

In this section a survey is made from the definition of speech to its evaluation in the audiology clinic. The importance of the components of speech in hearing tests of children is stressed. The difference between detectability and intelligibility of speech is clarified. Examples of the representative types of speech materials used in articulation tests are given. Articulation tests are fully discussed. How speech materials are developed and how such materials influence the articulation score is described. Speech audiometry in the clinic is exhaustively reviewed. The correlations between speech thresholds and pure tone thresholds are tabulated. How speech can be a valuable tool in diagnosing auditory maladies is outlined. Modern developments in speech audiometry together with experiments conducted by leading audiologists of our time are reviewed.

Part two - Masking.

In this section the problems of masking are enumerated. Three types of masking noise and their clinical application are described. Interaural attenuation is fully explained. Hood's graphic illustration of interaural attenuation together with explanatory notes clarifies a major masking problem. Advice is given on when to mask in air and bone conduction. The advantage of insert receivers over headphones when masking, is shown. Hood's classic method of masking is fully discussed with the help of illustrations.

SHAW, STEPHANIE D. 1972.

Examination of the significance of the signal attenuation rate in Bekesy audiometry.

Supervisors: I.G. Taylor
K. Chiveralls.

The aim of this study is the examination of the significance of the signal attenuation rate in Bekesy audiometry. The frequency attenuation rate was kept constant while the signal attenuation rate was varied, using three different speeds or rates of increase of intensity of the test tone in decibels per second. The mean amplitude or peak to peak excursion of the tracings was looked at and analysed. The essential comparison was between the differing amplitudes for the differing attenuation rates.

It was attempted to establish on a group of normally hearing subjects between the ages of 19-50 years the range of mean excursion amplitudes found for the three different attenuation rates for both interrupted and continuous tone tracings, using a sweep frequency. In the final analysis only 38 of the original group were used as the results of the other twelve did not comply with the criteria established for the experiment.

Having established the range of peak to peak amplitudes on the subjects tested in this experiment, their significance is looked at particularly in the light of present methods of classification according to Jerger. The significance of the separation of the interrupted and continuous tone tracings is examined.

Also taken into account with this is whether the classification for an individual person changes according to signal attenuation rate.

As a secondary section it was proposed to look at Bekesy audiograms obtained on subjects with hearing loss. The testing and anlysis was to be the same as that of the normally hearing subjects and the results again compared to Jerger's. Although it was not possible to obtain a large sample of subjects who fell into the appropriate categories, those tested have been reported on.

A review of the methods of classifying Bekesy audiograms that have been proposed since the audiometer was first designed is followed by an anlysis of a different method of reaching the classification. This method is based on the results of analysis using the results obtained for the differing attenuation rates. The results are then compared to the conventional method of classifying Bekesy audiograms. Finally, there is a discussion of the abnormal group tested and a comparison of classifications.

TRAYNOR, J. 1972.

A comparison of the two National Health Service hearing aids: O.L. 56 and O.L. 66

Supervisor: J.E.J. John.

The dissertation includes a general survey of the development of hearing aids, with a section assessing the value of speech audiometry. The acoustic performance of three samples of each aid is compared, and the results of speech audiometric tests using the aids are displayed. The subjects who cooperated in the test were 12 partially hearing children whose ages ranged from 7 to 16. There was no significant difference between tests making use of the O.L. 56 and those making use of the O.L. 66.

YEATS, JOAN M.

1972.

A psycholinguistic model designed for use with slow learning deaf children.

Supervisor: L.A. Ives.

A brief historical review of intelligence and intelligence testing is given. Particular reference is made to intelligence testing with deaf children.

Piaget's contribution to the psychology of intelligence and his theories of child development are considered briefly.

A psycholinguistic model is formulated as a frame of reference and items designed to test aspects of this model are shown.

A practical study carried out with children attending a School for Deaf is then described.

Suggestions are made for remedial programmes.

Conclusions are drawn.

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Certificate for Teachers of the Deaf

This Certificate is awarded on the successful completion of a one year full-time course of study and training. It is recognised by the Department of Education and Science as a qualification to teach in special schools and classes for the deaf and partially hearing and to be employed as a peripatetic teacher of the partially hearing. It is also recognised by the Scottish Education Department, the Ministry of Education of Northern Ireland and by the Ministries of Education of a number of Commonwealth and overseas countries as leading to the status of qualified teacher of the deaf.

Candidates from the United Kingdom may be admitted to the course immediately after graduation, after graduation, after the completion of a College of Education course, or after experience as a qualified teacher. Those in the last-named group are expected to be seconded on salary if they are currently employed in maintained schools. Graduates without previous training are requested to undertake short periods of practice in ordinary schools before the course begins and after the written examinations in June, in order to be recommended to the Department of Education and Science for the status of qualified teacher.

Overseas candidates are expected to be qualified teachers in their own country, with academic standards comparable to those of United Kingdom candidates.

Further information about the course and copies of the prospectus and application forms may be obtained from :-

Dr. T. J. Watson,
Department of Audiology and Education of the Deaf
University of Manchester,
Manchester M13 9PL.

(Telephone: 061-273-3333)

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Degree of B.A.
with Honours in Combined Studies

From October 1973 the Faculty of Education offers the degree of Bachelor of Arts to students who intend to become teachers of deaf and partially hearing children. The course leading to the degree extends over four years and provides for the study at Honours level of a coherent group of subjects. The degree of B.A., with Honours in Combined Studies supplants the General degree of B.Ed., which has previously been offered to prospective teachers of the deaf.

The subject entitled "Education and Audiology" will be a subject of study in each of the four years. A second subject will be taken for three years and a third subject for two years.

The main academic study of "Education and Audiology" will occur in the first three years. In the fourth year it will be the only subject of study and the work will be concerned with the more obviously professional and practical aspects of teaching. During the four years students will learn about the education of hearing children and of children whose hearing is impaired. They will undertake teaching practice in ordinary schools and in special schools. Those who successfully complete the course will be recommended to the Department of Education and Science for recognition as qualified teachers and qualified teachers of the deaf.

The second and third subjects may be chosen, subject to certain limitations, from

> American Studies, Biology, Botany, Chemistry, Classical Civilization, Comparative Religion, Drama, English, French, Geography, Geology, German, History, Italian, Latin Studies, Mathematics, Physics, Near Eastern Religion, Russian, Spanish, Zoology and courses in Economic and Social Studies.

For these subjects students will join classes and take identical courses and examinations as students in the Faculties of Arts, Science and Economic and Social Studies.

Advice about the course or the suitability of previous studies as preparation for it, together with copies of the prospectus and other literature may be obtained from the Admissions Officer :

Miss J. N. Howarth, M.A.,
Department of Audiology and Education of the Deaf,
The University,
Manchester M 13 9PL.

Degree of M.Ed. in Education of the Deaf

Education of the Deaf is one of the areas of study in which a course is offered leading to the degree of M.Ed. Method I (by examination and dissertation) in the Faculty of Education.

The degree is awarded after successful completion of a prescribed course of advanced study in the education of the deaf, which is recognised by the Department of Education and Science as a course for which teachers may be seconded on salary, with the approval of their employing authorities.

The aim of the course is to enlarge teachers' capacities to organise and, where necessary, to create conditions for effective education for children with impaired hearing. It is intended mainly for qualified and experienced teachers of the deaf who hold, or who wish to train for, responsible positions within the educational services for hearing-impaired children.

Study is concentrated in the following four important areas :

(i) Communication Studies
(ii) Curriculum Studies
(iii) Educational Psychology
(iv) Management Studies

The course extends over one year and full-time attendance is required from October to June. Attendance beyond that date and up to the end of September will be required for individual meetings with supervisors of dissertations.

Assessment is mainly by written examination and dissertation. The written papers are taken in June and the dissertation needs to be submitted by the end of September.

Candidates for admission to the course must be graduates or have other qualifications and experience which are satisfactory to the Board of the Faculty of Education and they must satisfy the Board of their competence to undertake appropriate advanced study or research.

Further particulars including the syllabus may be obtained, together with other information, on application to :

The Professor of Audiology and Education of the Deaf,
University of Manchester,
Manchester M13 9PL.
(Telephone : 061-273-3333)

Diploma in Advanced Study in Education of the Deaf

The course leading to the award of the Diploma in Advanced Study in Education of the Deaf follows broadly the pattern of the M. Ed. degree course in Education of the Deaf and work is concentrated in the same areas of study.

The course is available for those candidates who do not satisfy the admission requirements for the M. Ed. degree. Candidates must, however, be qualified teachers of the deaf with appropriate experience.

Assessment is mainly by written examination and reports on field work, and full-time attendance is required from October to June.

Candidates who successfully complete the Diploma course are eligible to apply for admission to M. Ed. courses in the Department, in particular the M. Ed. Method II course (by thesis) which may be taken on a part-time basis.

Further particulars, including the syllabus, may be obtained together with other information, on application to:-

The Professor of Audiology and Education of the Deaf,
University of Manchester,
Manchester M13 9PL.

(Telephone : 061-273-3333)

Degree of M.Ed. in Audiology

Audiology is one of the areas of study in which a course is offered leading to the degree of M.Ed. Method I (by examination and dissertation) in the Faculty of Education. The course is of academic and practical studies in clinical and educational aspects of audiology. The three main topics of hearing, speech and deafness are considered from the standpoints of the disciplines of education, medicine, physics and psychology.

Clinical and laboratory sessions provide extensive practical experience in the ascertainment, assessment and rehabilitatory treatment of hearing disorders more especially in children but also in adults and in the bases of this work in physical and educational audiology.

The course extends over one year and full-time attendance is required from October to June. Attendances beyond that date and up to the end of September will be required for individual meetings with supervisors of dissertations.

The examination is by practical and written examination and by dissertation. The written papers and the practical examinations are completed in June. The dissertation is to be submitted by the end of September.

Candidates for admission to the course must be graduates or have other qualifications and experience which are satisfactory to the Board of the Faculty of Education and they must satisfy the Board of their competence to undertake appropriate advanced study or research.

The course is recognised by the Department of Education and Science as a course for which teachers may be seconded on salary with the approval of their employing authorities.

Particulars of the course including the syllabus may be obtained together with other information on application to :

The Professor of Audiology and Education of the Deaf,
University of Manchester,
Manchester M13 9PL.

(Telephone : 061-273-3333)

Diploma in Audiology

The course provides practical and theoretical studies in clinical and educational aspects of audiology for teachers of the deaf, psychologists, registered medical practitioners and speech therapists, who have approved experience. It is generally intended for candidates who do not meet the requirements of the Board of the Faculty of Education for admission to the course for the Master in Education in the area of audiology but will also appeal to candidates who seek a shorter course with a strong practical orientation. Candidates who successfully complete the Diploma Course in Audiology are eligible to apply for admission to M.Ed. courses in the Department, in particular the M.Ed. Method II course (by thesis) which may be taken by part-time students.

Full-time attendance from October to June is required for the Diploma Course. There are written and practical examinations. The assessment for the practical examination is mainly by course work.

Particulars of the course are included in the prospectus of the Department which may be obtained on application to:-

The Professor of Audiology and Education of the Deaf,
University of Manchester,
Manchester M 13 9PL

(Telephone : 061-273-3333).

Degree of M.Sc.

A course is offered in the Department of Audiology and Education of the Deaf, leading to the degree of M. Sc. in Audiology, Method I, (by examination and dissertation) in the Faculty of Medicine.

The aim of the course is to meet the requirements of the hospital services by providing integrated studies in both the theoretical and practical aspects of audiology.

The main emphasis of the course will be on clinical audiology and will include the diagnostic assessment of hearing in all age groups. Study is concentrated on the following areas :- the anatomy and physiology of hearing and balance, the pathology of deafness, physical audiology, instrumentation and hearing aids. In addition there will be a subsidiary course in the social and psychological aspects of hearing and deafness.

The course extends over one year and full-time attendance will be required from October to September.

Assessment is by examination and dissertation on the theoretical side but practical assessment is based on both the course work and a practical examination.

Candidates for admission to the course must be graduates or have other qualifications and experience which are satisfactory to the Board of the Faculty of Medicine and they must satisfy the Board of their competence to undertake advanced study or research.

Further particulars including the syllabus may be obtained together with other information from :

Professor of Audiology and Education of the Deaf,
Department of Audiology and Education of the Deaf,
The University,
Manchester M13 9PL.

(Telephone : 061-273-3333)

AVAILABLE ON LOAN

"VISUAL AND AUDITORY CLUES FOR USE WITH DEAF CHILDREN"

VTR. No. 365/1 - for Part 1. Running time 55 minutes.
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This tape is designed as parent guidance and general training material. Mr. Campbell, Lecturer in Parent Guidance in the Department, discusses the important aspects of the Visual Clues in Part 1. In Part 2, he concentrates more on the Auditory Clues and demonstrates filtered speech. In Part 3, we see two samples of parent and child guidance sessions.

"SCREENING THE HEARING OF BABIES AND YOUNG CHILDREN".

VTR. No. 370 - running time 55 minutes.

Professor Taylor considers the principles of screening tests of hearing of babies and young children. He illustrates the points by actual demonstration, in which he is assisted by Mr. G. B. Campbell.

Hire charge per tape : £5-00 (including registered post)

Purchase price per copy of a tape : £45-00.

Applications for the loan of the above Video Tapes should be made direct to : The Director, The Television Service, University of Manchester and UMIST, Oxford Road, Manchester M13 9PL.

The following films have been sent to us to offer on free loan :-

EVERYTHING BUT HEAR ..... Clarke School for the Deaf, Northampton, Mass. U.S.A. 16 mm. sound colour film. Running time : 15 minutes.

A DEAF CHILD IN THE FAMILY .... The New Zealand Teaching Films to Help Deaf Children Society Inc., 16 mm. black and white film. Running time : 40½ minutes.

Department of Audiology and Education of the Deaf

CONFERENCE OF HEADS OF SCHOOLS FOR THE DEAF AND PARTIALLY HEARING

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Woolton Hall

Thursday, 28th September, 1972	SCHOOL MANAGEMENT	Chairman: Mr.I.D. Spencer
9.30-10.20	"Some management problems".	Mr. F. Tye, B.Sc., Director, N.W. Education Management Centre - Padgate College of Education.
10.20-10.45	COFFEE	
10.45-11.45		Mr. P. Gaskill, B.A., M.Ed., A.B. Psychol.S., Principal, Royal Cross School for the Deaf, Preston, Lancs.
11.45-12.30	Discussion	
	LUNCH	
	HEARING AIDS	Chairman : Mr.H.J.S.Furness.
2.00-3.00	1. "Factors affecting the choice of hearing aids and their efficiency in use."	Mr. Alan Huntington, B.A., Senior Research Associate, (Ewing Foundation), Department of Audiology & Education of the Deaf.
3.00-3.30	2. "Survey of hearing aids."	Mr. W. D. Hine, M.A., (Oxford and Liverpool), Lecturer in the Education of the Deaf, Department of Audiology & Educn. of the Deaf.
3.30-4.00	Discussion.	

********* CONFERENCE DINNER ******** WOOLTON HALL ******** 6,30 for 7.00 p.m.

Friday, 29th September, 1972	TEACHING OF READING	Chairman : Mr. P. Allen
9.30-10.20	"Present trends in the teaching of reading to ordinary children."	Dr. Joyce Morris, B.A., Ph.D. Dip. Child Dev.
10.20-10.45	COFFEE	
10.45-11.45	"Research into reading".	Mr. G. W. Redgate, B.A., M.Ed. Dip. Ed., Lecturer in the Education of the Deaf, Department of Audiology & Education of the Deaf.
11.45-12.30	Discussion	
	LUNCH	
2.00	Open Forum.	

CONFERENCE FOR HEADS OF SCHOOLS FOR THE DEAF

UNIVERSITY OF MANCHESTER

"Some Management Problems"

F. TYE

(Director, North West Educational Management Centre)

You will have noticed that the title of this paper is "Some Management Problems". When a visiting speaker to one of your conferences offers some management solutions, then the gates of Paradise will be open. It is common for speakers on these occasions to take out an insurance policy at the beginning and say that they are simply going to raise questions and not offer answers. I am going to say just this, but with some force, because fundamental to my philosophy is the belief that there are no solutions which are universally applicable. I am not going to send you away with a handbook containing standard, correct solutions to a set of standard problems, because I believe it would be quite wrong to attempt to do so. Circumstances, resources, and people differ from school to school. We must, of course, all find answers for ourselves and for our own schools, but they must be our own answers. Because schools are people; even heads are human and each one of us has his own style. Some of us are extravert, some shy; some good on paper and some in face to face spoken communication. One man's methods could be disastrous if adopted by another. In fact, I believe that one of the most pernicious of current ills in education is the bandwagon mentality. It is so tempting to adopt for ourselves, lock stock and barrel and unthinkingly, a successful technique being practised in another school by a convinced enthusiast. Often we find that we do not fully understand the method, we have not acquired the necessary resources, we have not been appropriately trained or that it simply is not us.

So, what am I going to do? I hope to offer a framework of principle; a skeleton on which you will put flesh and clothes on your own design. In fact, I cannot offer an itinerary, but I shall try to provide a map.

Now, let us look at this word 'management'. Most of us recoil in horror at its use in an educational context. This is perfectly understandable, because the word carries overtones of nuts and bolts, of profit margins, of salesmanship and of the manipulation of people. However, within my definition of management, we are all managers. There are several definitions, but I offer you three:-

1. The organisation of resources to a defined end within a system of constraints

2. The narrowing of the gap between what is being achieved and what could be achieved with the same resources

and more lightheartedly, but perhaps nearer to our hearts,

3. The taking of decisions on inadequate information and then living with the consequences.

Is this not what we are all doing all the time? I believe that it is, but it is not my purpose to try to convince you. We are going to talk about running schools. Not about curriculum or teaching methods, because I believe that these topics lie much more within the sphere of your expertise than they do in mine, and, in any case, the truth is that most of our time, as heads, is quite properly devoted to other problems. For, whether we like it or not, it is generally true that the higher promotion takes a person, the less he uses his specialised initial training. We were all trained as teachers; how many of us were trained as heads? And yet we operate more now as heads than as teachers.

So, what are we doing? I have already given a definition of management. I now want to suggest a closer analysis of the functions of a manager, which I believe is applicable to any managerial role. I see the job of a head or any other manager as:-

1. <u>Analyse precisely the situation in which he finds himself</u>.

It has been said, unkindly, that educationists often take a child from where he is not, to where he does not want to go. This may be an exaggeration, but it is essential to define a problem as coolly as possible. Very often the problem as presented is not the real difficulty; something lies behind and beneath it. And surely it is necessary to assess an existing situation before developing a new one. What is the child's reading or hearing capacity? What are the factors of temperament or personality operating in the common room? What resources of men and materials are available to us, both within and outside the school?

2. Identify his aims and objectives and establish an order of priority.

This is difficult in education, but I submit that it is essential, mainly because if aims are not stated explicitly, they will be deduced and built up by case-law. Every action we take; every statement we make is interpreted by other members of the school community and gives a message. If, for example, we initiate and closely supervise every activity of staff and children, we indicate quite clearly that the encouragement of initiative is not a major aim of the school. And, there is the further point that if we have not identified aims and objectives we lack an important criterion against which to assess progress. If we have no target, how can we tell whether we are moving in the desired direction? Several aims and objectives can, of course, be in mutual conflict, either in themselves or in urgency. It is, therefore, important to determine an order of priority. Some may have to wait; sometimes we may have to take a step backwards in order, at a later stage, to be able to move two steps forward.

3. Devise and put into operation the means of achieving his aims and objectives.

This step is always at the front of our minds. We are, in fact, in constant danger of over-involvement with means to the exclusion of a consideration of ends. We spend so much time in the engine-room that we never get up onto the bridge to see where we are going. Clearly, however, it is an important function of the head and I propose to return to it in a little more detail, when we have looked at step number 4.

4. Devise and put into operation the means of assessing the extent to which aims and objectives are being or have been achieved.

Although I state this as the fourth and last stage in what appears to be a linear process, the whole business is really circular, because the process of assessment leads us back to the beginning. Having achieved one objective, we must set the next. If our assessment shows that we have not been successful, then we must go back and modify either our aims, objectives, methods or all of them. Perhaps we have been over-ambitious or unrealistic or perhaps we chose the wrong method of tackling the problem. I should like to return to this theme later.

This, then, is my analysis of the functions of a manager. In case it sounds long-winded, academic or jargonistic, I want to translate the four functions into more homely terms (which are, perhaps, more easily remembered), and frame the four points as four questions to be asked whenever you are faced with a problem.

1. Where are you?
2. Where do you want to go?
3. How do you get there?
4. How do you know when you have got there?

Now, let us go back to step number 3. How do you get there? It is first necessary to consider all possible methods that can be thought of. And there will always be more than one way of tackling a problem, even if the second possibility is to do nothing! Each possibility must be considered in relation to the resources available and in relation to the probable consequences, the risks and the certainties. Then a plan having been made, it has to be implemented with the knowledge and co-operation of everyone concerned. It sounds straightforward, but everybody knows that it is easier to talk about running a school than it is to run a school. In fact, it is a difficult business involving at least five interwoven strands which are inseparable, but which for the sake of argument I have listed separately:-

(a) Communication.
(b) Consultation.
(c) Delegation.
(d) Use of resources (of space, time, materials, manpower).
(e) Organisational structure.

Let us look at the first three of these management skills a little more closely.

(a) <u>Communication</u>. To my mind this is the most intractable of all problems. Think of the usual methods of communicating in schools. Notice boards, written messages placed in pigeon-holes, bulletins, announcements in meetings of various sizes, reports. Do they work? How does the junior master communicate with the head? How does one head of department know what a colleague head of another department is planning? Do parents really know the philosophy and practice of the school? Does the small boy understand?

I wonder if anyone is satisfied with his communications system. I am not and I never have been, but there is a threefold question I want to put to you, which may be helpful as a starting point for trying to create a system out of chaos.

(a) Who ought to know what?
(b) How do they know?
(c) How do you know that they know?

These are disturbing questions but they have to be asked and, if possible, answered in any organisation, irrespective of size. Obviously, increasing size brings increasing difficulty, but the problem is there even in a two-teacher, husband and wife rural primary school. Indeed, I would say it is present even in a one-teacher school: even there the teacher must not only communicate with children but must try to provide channels through which children's views, anxieties, doubts and enthusiasms become known. Communication is not a one-way process as a pre-occupation with notice boards, pigeon holes and bulletins seems to suggest. It must work downwards, upwards and sideways. But, not necessarily all at the same time. Trying to play safe by telling everyone everything is likely simply to clog the machine. It has been said that the Xerox copier is killing good management, because it is so easy to let everyone have copies of everything. People who receive large quantities of paper, much of which is irrelevant to their particular job, simply stop reading any of it. So, the first question, above, has to be answered and needs a policy which suits the circumstances of a particular organisation. It is worth considering the provision of standard distribution lists for certain kind of information, but there will always be an area of discretion and judgement and sometimes, of course, judgment will be less than perfect.

It would be wrong to take time now to discuss in detail the value of various mechanical methods of communication and the built-in checks and acknowledgements needed to answer the second and third questions. I do want to say, however, that I know no school or indeed any institution which can be complacent about communications. We can be up to date with methods and punctilious in our attention to detail, and still it can go wrong, largely because of the subtlety of the human mind. We are all capable of operating a filter system. We take from conversations the ideas we want to accept, forget unacceptable sentences, interpret real or imagined nuances. And as the initiators of messages or discussions we are very often the victims of our own familiarity with the subject of the communication. Words which we have been using in our own thinking we use in communication and know what they mean to us. They can, however, mean something slightly different to

others. Do I seem to be in despair?

Well I do not pretend that communication is easy; I do not even say it is difficult - I think that it is almost impossible. I say this to underline the importance of keeping at it, of spot-checking the way it is working and always trying to improve it. The objective is to get information to people who need it, at the precise time that they need it and in a form which permits no misunderstanding. We can get a very long way towards this objective by accepting its importance and giving it a good deal of attention.

(b) Consultation.

I think it is clear that no organisation can function without a communication system. Is the same true of consultation. In such a framework, however, the head is depriving himself of professional advice, he is not providing any training for his colleagues who might, with help, achieve promotion and, of course, for many he is reducing the satisfaction they get from their jobs. Not, of course, for all. There are people who genuinely want to be told what to do, to be provided with resources and left to get on with it. There are others who like to be asked for an opinion but do not wish to be associated with carrying the responsibility for a decision. Not everyone wants or would welcome genuine and thorough participation. For this reason, and because the subject of any consultative process will vary, there will probably develop in most schools a variety of practice. There will be full staff meetings; heads of departments or heads of years meetings; study groups and ad hoc working parties. Often there will also be informal consultations over coffee in the common room, sometimes casual and accidental, sometimes deliberately engineered. Such informal talks can be pleasant, easy, valuable, important and of course outside of the inhibiting committee structure. They add another dimension because one must recognise that informal structures exist in schools. There are people to whom others turn for help, advice or leadership and they are not necessarily the people who are recognised in the staff lists as carrying responsibility. It would be a mistake to ignore this. One must always be aware, however, of the danger that informal conversations will be magnified in significance by those taking part. If an ill-formed half idea is discussed over coffee, it can become a hard and fast, usually iniquitous, plan by the time it has been relayed by three gossiping colleagues who like others to believe that they are "in the know".

Again, therefore, there are questions of judgment involved. How does one get the right blend of formal and informal consultation? How does one ensure that colleagues and children feel that they matter and that they are kept in touch with the development of ideas which they have discussed or which they have initiated. Two final points in this very brief sketch of

problems :

1. It is wise to give considerable thought to the framing of questions put to others. To ask for a view of a specific proposal can often be inhibiting. First, of course, there may be an indication of commitment to the proposal, which makes some people reluctant to criticise it. Secondly, there is the danger of restricting the broad sweep of possibilities. If any of us is given a problem and a solution to discuss, we have more difficulty in finding other solutions than we would have if simply given the problem. Questions fed into the Consultative Machinery should therefore be as open-ended as possible.

2. Despite my commitment to consultation, in principle and in practice, I do not believe that any amount of consultation can relieve the head of a school of ultimate responsibility. I would not go so far as Dr. Jowett, the former and famous Master of Balliol, but I think that sometimes a head has to ignore a majority view (on a simple one man, one vote system) and give different weight to different voices in coming to his own decision and promulgating it. Jowett, you may know, is said to have put a proposal to a meeting of the Fellows of his College and, after discussion, found his colleagues united and unanimously against him. His only concession to this strong opposition was to say that he would adopt his proposal with the greater reluctance. Between this extreme and the other, which is collegiate decisions under the head's chairmanship, there is a broad spectrum. Each one of us will find his own position to suit his own style and the wishes of his community.

(c) Delegation.

The opinion of heads on the question of delegation lies, apparently, along an equally broad spectrum "I don't believe in delegation"; "I delegate only out of necessity"; "I do wish I could learn to delegate more"; "I couldn't run my school without a complete structure of delegation". But the truth is that every head, even the most authoritarian holder of tight reins, delegates the moment, for example, that he devises a time-table. A time-table is, in fact, a good example of delegation in practice. The responsibilities of all concerned are clearly defined and expected to be shouldered. Accountability is to some extent built in.

There used to be a splendid headmaster in Yorkshire who claimed that he could teach any subject in the curriculum more effectively than the teachers nominally responsible for subjects. He was a remarkable man and there was evidence that there was truth in his statement. He, therefore, regretted having to delegate responsibility for teaching classes. But he had to do so, partly because of time but also, (and this is an important, humbling, lesson) because had he tried to spread his thinking and energy over all the subjects at one time he would have taught all of them less effectively than was the case in his delegated system.

We can agree, therefore, that we all delegate to some extent. I do not think we all delegate to the same degree, nor do I think we are all equally skilful at defining delegated powers or at acquainting everyone with the necessary information which would allow them to know which colleagues have the duty and the power of decision on which questions. Some of us, too, are not very good at resisting the temptation to resume personal control at every crisis. Again, we are faced with a question of judgment. A colleague to whom a job is delegated wants and deserves to be allowed to do it without interference. On the other hand he likes to know that his chief is interested, is there to give support and advice and, above all, is likely to say "well done" with conviction and sincerity because he knows what is hapenning and is assessing it. Judgment is required, too, from the man who exercises delegated powers. He must be able to recognise those questions he can handle himself in a self-contained way, those which he can settle but must inform others of what he has done, those on which he must seek advice and, (most difficult of all) those which are potentially explosive and must be fed upwards to the top with all possible speed. In conversation with the head of a large institution, recently, I asked how successfully problems were filtered for him. He answered that very few reached his desk, but those that did were both difficult and interesting and therefore enjoyable, but the most frustrating aspect of his work was that very often the difficult hot potatoes reached him too late. Earlier action might have kept them cool. If confidence between colleagues is good, if communication and consultation systems are well developed then judgment can be reinforced and mistakes minimised, because people can more easily mention things to each other without feeling that discussion of a problem is a sign of weakness.

Let nobody think that delegation is a way of getting rid of worrying work. In delegating work, the head is parting with some degree of authority to someone else (and he must be prepared to do this contentedly), but he is not diminishing his own responsibility. In fact he is now responsible

for another person's strengths and weaknesses as well as his own and to that extent his responsibility is increased rather than diminished. Very often, therefore, we are ambivalent in our view of delegation. It can be argued that decisions should be taken as near to the centre as possible because that is where all the information is likely to be. On the other hand, it can be held that decisions should be taken as near the point of operation as possible. In the first case, despite obvious advantages, the system can slow down, inhibit experiment and make costly mistakes. In the second case, people making the decisions are the first to feel the effects and, therefore, it is a more sensitive organisation. Experiment can be encouraged and quickly tried, but this will bring with it, of course, a diversity of practice, a variety of different answers to similar problems which may or not be acceptable to the community as a whole. How much lack of uniformity can a single organisation stand? A question to which there cannot be a unique answer - and the pendulum swings. A mistaken decision in the 'front line' and the reins are pulled tight. Frustration on the 'shop floor', or slowness at the headquarters, and decisions are delegated more freely. There is a tendency in this as in some other matters to rush in fashions from one extreme to the other, illustrating what an H.M.I. I know calls the law of false opposites, which is that "if one course of action proves to be a mistake, there is no reason to assume that a diametrically opposite course will prove to be successful". We need to be calm and patient in trying to get a workable, acceptable and satisfying method of working and it will, I believe, involve at least a measure of delegation in order to avoid apoplexy at the centre and anaemia at the periphery.

Let us now consider the last of the four questions posed at the beginning. How do you know when you have got there? All I can do within the space of this lecture is to indicate what I believe are our fundamental difficulties and to suggest some highly generalised pointers towards solutions. The difficulties of assessment in the educational context are, I believe,

1. We are too close to the problem.
2. We have a vested interest in our own decisions.
3. We find difficulty in defining aims precisely.
4. Methods of assessment can determine aims (e.g. examination syllabuses).
5. Much that we value is not easy to quantify and therefore to measure.

It is very difficult for us to establish clear criteria and objective approaches, but this should not prevent us from making an attempt at precision and objectivity. Since, in fact, we do not hesitate to assess - 'a good year'; a 'poor fourth form'; 'a reliable colleague'; a 'first class teacher' - we really cannot duck the need to make sure that our assessments are as valid and reliable as we can make them. Therefore, we should try actually to write down our criteria, to make direct personal observations, to stand back coolly as far as possible and, above all, to welcome 'consultants' of all kinds (Inspectors, advisers, parents, pupils, colleagues on the staff, Governors, administrators). It is not easy, of course, to get honest comments from such people who are also, very often, kind friends. It is often possible, however, to discuss the work of one's school in such a way as to discover where frustrations lie, where resources are badly distributed, where are the strong and the weak points. And the next step is for a head to ask himself to what extent he can remove irritations, exploit strengths and remove weaknesses. Self-assessment, in other words. There is no need to be morbidly introspective or neurotic about this, but it is worth asking to what extent we are doing the job that is expected of us by others and by ourselves. Are we doing those things which nobody else can do and which are most likely to further our aims and objectives? Or are we doing the jobs which we enjoy doing or which move, with measurable satisfaction, the greatest volume of paper per day? If we teach, are we using our time more profitably than if we were to sit and think for the same period? An interesting question.

This lecture has been full of questions as I warned that it would be. I leave you where I started, in more ways than one. I do suggest, however, that in approaching any of the thousands of decisions, trivial or major, which a head makes in the course of a year, it is helpful to go (even if very quickly) through the four questions.

Where am I?
Where do I want to go?
How can I get there?
How will I know when I have got there?

I certainly find it so.

CONFERENCE FOR HEADS OF SCHOOLS FOR THE DEAF
AND PARTIALLY HEARING

"Some Management Problems in Schools for the Deaf"

P. GASKILL

(The Principal, Royal Cross School for the Deaf, Preston, Lancs.)

Mr. F. Tye's most valuable interrogation, dialogues and dialectic about management suggests a worthwhile similar study into our own special field for university research investigation at M.Ed. or Ph.D. advanced degree level. A few major headings as applied to studies in the education of the deaf might profitably include :

(a) The Head in the School community
(b) The Head and Her Majesty's Inspectorate
(c) The Structure of Authority
(d) Communication
(e) The Head and the Law
(f) Organization and Curriculum
(g) The Head and Teacher Training.
(h) Staffing and problems of personnel management in boarding, day schools and local education authority special services.

In each of these headings there are also sub-divisions worthy of detailed study.

Prior to this Conference I read the schemes of responsibilities in such schools as the Abraham Darby School * with reference to the delegation of duties in matters of maintenance of academic standards, discipline and welfare, school philosophy, parents and relationship with school, administration and technical assistance, standards of dress and behaviour, social activities of boys and girls and house assemblies, careers and external examinations. I found that administrative schemes appropriate to large comprehensive schools were not necessarily those best suited to the needs of teachers, ancillary workers and pupils in our smaller more personal and individualized communities.

Mr. Tye rightly suspects the term management, but it is interesting to review varied definitions and attitudes to our work. Management, in the sense of control, direct or having the capacity to do anything (from the Italian maneggiare to handle and train horses) can be seen in the term Director. It's meaning has also been influenced by the French ménager to direct a household - hence to economise and to husband resources. This interpretation was very evident in the institutional development of our schools

during the nineteenth century and was still present in the immediate post world war II period. The art of a head guiding or leading from the French mener was the favoured definition encouraged by the Board of Education in its valuable Handbook of Suggestions to Teachers, H.M.S.O. 1937 (p. 55) "The tone and well-being of a school depends upon the quality of the Head Teacher's leadership. While his duties will vary in accordance with the type of school he is in, a certain breadth of outlook and energy in direction will characterise his actions. Unless he himself is a person with some live intellectual interest of his own, he can hardly expect to exert any lasting influence on the intellectual growth of his pupils." Mr. J. G. Shaw, the first headmaster of Royal Cross School for the Deaf, Preston, which was opened in 1894 under the name The Cross Deaf and Dumb School, is frequently referred to in the Minutes of the Board as the Master of the Institution. Prior to his appointment he made an interesting report on Deaf and Dumb Institutions in the United Kingdom based on inquiries issued in a circular to each of the thirty institutions in existence at the time. The seven tables cover Buildings, Receipts and Expenditures, Fees and Grants, Classification of Pupils, Statistics of Deaf-Mutism, Remuneration of Staff and finally a summary of these tables for institutions containing fifty children which Shaw calculated was the estimated requirements for deaf children in N.E. Lancashire. Appendix B concerns a report on the Pure Oral System based on visits of Shaw with a sub-committee of three governors to the London Schools, including Fitzroy Square with its Training College, and the Margate School which was the largest institution in Europe and taught on a dual system. Their itinerary was supplemented by the report of the Royal Commission on the Deaf and Dumb (1886-89) and their conclusions were that a dual system would answer all the requirements of the new school.

1. Every child was to be given a year's trial in the oral department.
2. At the end of twelve months pupils were to be removed to the sign and manual department according to the discretion of the Head.
3. Oral pupils were to be graded thoroughly and periodically, allowing one teacher not more than ten pupils and providing a separate teacher for four or five pupils in case of necessity.
4. Oral pupils were to be taught by lip-reading and auricular methods each child being medically examined and treated according to his special qualifications.
5. Oral pupils were to associate with sign-taught pupils in the playground as this is not hurtful but beneficial.
6. The school was to be arranged in classified standards and given the same lessons in language and in general and religious knowledge in both departments.

Mr Shaw, formerly editor of the Blackburn Times but not a qualified teacher, was unanimously elected Master in view of his excellent efforts in raising money and arousing interest in county and local areas. Mrs. Shaw became Matron and the pattern of joint appointments of married principals established, which except for one brief period prior to Mrs. Shaw's retirement has continued throughout the history of the school.

With the building of the Rawstorne Hall with its eight classrooms with moveable glass partitions around a central hall and the headmaster seated at a high desk in a strategic observation position, problems of communication with teaching staff and pupils were minimal, but it was a system hardly conducive to trust and good staff relationships. The teachers were for the most part ex-pupil teachers, who when joining the staff had themselves finished a very limited secondary education and Mr. Shaw, himself untrained, joined in the prevailing pattern at that time of in-service study and practice resulting if successful in Board of Education Teacher Certificates or those of the College of Preceptors and a few possessed certificates as Teachers of the Deaf. The authority to appoint and dismiss teachers was delegated to the Headmaster. In 1911 out of a staff of 11 teachers, 6 were certificated, 3 uncertificated and 2 otherwise recognised. The dual system of teaching the deaf was not an unqualified success for the Inspection Report of that year states that " the outstanding feature of the children's language was the weak power of verbal expression whether by speech, writing or finger spelling. Some very serious effort will be necessary to overcome this and it is suggested that it would be beneficial if some of the senior teachers could visit other well known schools where the teaching of language as a means of expression is more successful " (Headmaster's Log - Vol. 1, Page 178). Schemes of work and the syllabus suggest a formal approach to speech and language including articulation breathing lingual exercises, tense drill, handwriting in Vere Foster's Bold Style copy books, grammar and composition including simple, contracted, co-ordinate and complex sentences. The practical subjects included letter press printing, scale drawing, woodwork, housecraft and cardboard modelling were well done. The school also gave outstanding performances in pantomime to large audiences and achieved a reputation in Lancashire for the excellence of the acting, properties and costume.

It was in the 1920's following the establishment of the Certificate in the Education of the Deaf at Manchester University that the quality of teachers entering Royal Cross shows a marked change. It is significant however that even in 1932 the Board of Education Report shows that for 3,735 pupils in our Day and Boarding Schools there were only 178 College-trained and 72 not college trained certificated teachers, 39 uncertificated and 89 others.

Of the Head teachers at the time only 16 were college trained, 19 not college trained, 1 uncertificated and 7 not specified, the ratio of pupils per teacher was 11 . 1 (Teacher of the Deaf, Jan. 1934, p. 32).

The report of the 12th Conference of the National College of Teachers of the Deaf held at Liverpool in July and August, 1934, gives an interesting account of the problems of two Heads, Miss Mary Grace Wilkins of the Maud Maxfield School for the Deaf, Sheffield and Mr. F. L. Denmark of the Liverpool Day and Residential Schools. Miss Wilkins held that the problems of national classification, the choice of residential school, buildings and equipment were not directly under her control. Her main role was within the school, the success or failure of her work depending on the use she made of the materials with which her school was furnished. She listed her essential problems under three heads :-

(1) The types of children we have to teach.

(2) The subjects we have to teach them.

(3) The organisation of the school so as to make the best possible use of equipment.

Miss Wilkins viewed with envy the large residential school "with its convenient buildings and generous equipment. The large number of pupils making classification comparatively easy, including even swimming and farming, giving the opportunity for a full curriculum with a minimum of wear and tear" (p.44).

Mr. Denmark's paper highlights the many special problems of the head of a boarding school including so many non-teaching ones "that he has little opportunity of practising the art of pedagogy. He has to know more than a little of building construction, to be au fait with the school medical service, to give thought to the problems of vocational training and placement, to devote much time to correspondence with local authorities, to collaborate with others in the smooth working of domestic arrangements and often times to act as father confessor to the parents of deaf children. Yet withal he must so organise his school so that he shall know at a glance what each teacher is doing because he is first and foremost a teacher and usually holds his appointment largely on his ability to teach. His first assignment should be to prepare a full and detailed instruction for the whole school." He also adds that to achieve the greater success in education you must appoint good teachers and within limits leave them to get on with their work. (p. 55). Mr. Denmark does not mention any accountancy work which was continually growing and occupied much time of heads of schools with either no or minimal clerical assistance. He also placed emphasis on teacher's weekly notes of school work being prepared

in duplicate so that he could be aware of work in progress in classes at any time of the day. Mr. Denmark concluded his paper with an apology for being unable to deal with such matters as physical education or that of school activities.

In the late 1950's the then Ministry of Education became very much concerned with the Boarding Problems of Special Schools and I regard the short course held at Retford from 5th to 13th April 1956 as a highlight in headteacher preparation. Out of 200 applicants Mr. Lumsden, Staff H. M. I. selected 50 headteachers and L.E.A. officials representing a wide selection of counties and varied handicaps, including blind, deaf, maladjusted, sub-normal and physically handicapped. From the joint discussions of the representatives and H.M.I's it was hoped to organise further courses and to provide schools with a trained professional or semi-professional house staff. The standard of lectures was high covering such topics as "The Head as Administrator", "The Problems of Nursery Children", "Adolescent Girls", "Books to read to children and principles in the selection of library books", "Planning the School day", "Spare Time", "Staffing", "The responsibility of the Boarding School for Religious Education". Following the lectures there were discussion groups on such important topics as School Buildings, Bootrooms and Linen Stores with the team necessary for Furnishing and Equipping a School. The conference finally closed with a most valuable lecture by Mr. Lumsden on the School Leavers, Mature and Immature, and the work of the Youth Employment Service. This conference left an abiding impression on the minds of many heads who were in the process of building new schools or modernising old ones. Lacking the prepared minds of management or the opportunities of American educators such as Dr. and Mrs. Pratt of the Clarke School for the Deaf, in Massachusetts, who according to their Annual Report between March 20th and May 31st, 1965 travelled through twelve countries in Europe and visited 32 educational programmes for deaf children, taking 1,000 coloured slides and 18 hours of tape, we have been most grateful to Her Majesty's Inspectorate. With their wider opportunities of studying varied educational organisations their valuable advice has been readily available to those heads in need. Although there always will be inadequacies in our schools and a continuing search for higher academic standards, there is no doubt in the minds of our long-serving administrators that the hearing world has become a more meaningful world to deaf children through the combined efforts of the D.E.S., the Governing bodies of our schools, our University Training Departments and Specialist professional organisations.

As Mr. E. Edmonds states in "The First Headship", Blackwell, 1968, " .. in our system of Western democracy all Heads exercise leadership which is based on consent and practised in fellowship, it calls for not only generosity of appraisal, tact, consistency, sensitivity to atmosphere and timing, but also in preparation for management. The Head should not seek to escape from management but rather to excel at it anticipating future requirements and shortening the time to obtain them." If we do this we shall enable our deaf pupils to gain a more reassuring glimpse of meaningful purpose in the puzzling labyrinth of the journey through school life to the adult world.

Mr. Lumsden, at Retford in 1956, challenged schools for the deaf to state their aims and objectives. Mr. Tye now asks us to establish similar priorities in management. I find that my own have been amended over two decades in the headteacher role and whilst these depend on our particular circumstances, our history, tradition, changing staff and different pupils, they present a raison d'etre for the modernisation of Royal Cross and my attempt to answer the question "why?". The object of the Royal Cross School in the original Laws was stated to be the Instruction of Deaf and Dumb Children of North and East Lancashire in Language, Religious and General Knowledge, and the Elements of Useful Industries. Whilst it remains true that most children afflicted by profound or severe deafness from early infancy cannot be treated in the same way as normally hearing children and differences existing amongst the deaf themselves are more pronounced because of additional disabilities, our fundamental aims have developed and changed over the years. These now include :-

1. The provision of a stable educational and welfare staff who accept the handicap of deafness and the child for what he is. A well-trained, sympathetic staff can assist parents to a proper acceptance of the hearing handicapped child through a positive, optimistic and encouraging approach to the child's problems.

2. The school environment should be structured to enable our pupils to succeed rather than fail. This is extremely difficult to achieve in a single class attached to an ordinary school or for the profoundly deaf child wrongly placed in a school for the hard of hearing or partially hearing children.

3. Downgrading from a unit or a partially hearing school to a school for the deaf should be avoided, if possible, by an improvement in pre-school diagnosis. It is always preferable to upgrade so as to avoid the disappointment of parental hopes and a sense of failure in the child for not maintaining progress in an unsatisfactory school placement.

4. The special school should emphasise the deaf child's assets and minimise his liabilities. We should provide them with satisfying rather than discouraging and unrewarding experiences. Linguistically and in verbally orientated subjects most deaf children will always be retarded.

5. Our approach to learning language should be through activity and direct experience both in and away from the classroom. Formal methods of teaching and the old authoritarian classroom structure with pupils as passive recipients of knowledge is no longer appropriate.

6. It is not the object of the school to be a substitute for parent and family, but with our small boarding units, we aim to provide complementary family experiences and a homely environment in which learning and growth can take place.

7. In staff and child relationships emphasis should be placed on trust rather than mistrust. Tendencies to overprotect or to reject should be avoided and children allowed to learn through their mistakes. Positive encouragement is preferable to excessive negative pressures. Patience and understanding are essential qualities in both staff and parents.

8. Children capable of taking external examinations such as G.C.E., C.S.E., or Lancashire and Cheshire papers should be given every opportunity of doing so. Schemes such as The Duke of Edinburgh Gold, Silver and Bronze Awards, Scouts and Guides, have much to offer deaf children in providing opportunities for self-thinking, self-discipline and initiative.

9. The school has no intention of creating a sense of failure in any of our pupils through devices such as ability streaming, adverse reports or impossible scholastic goals. It is our aim that the lives of all our pupils should be fulfilled in accordance with their individual needs.

10. Whilst we now recognise the importance of specialist teaching in Art and Craft, Woodwork and Home Economics, it is no longer the function of the school to provide trade training. School should be a preparation for a good life as an adult in a hearing society and to initiate children into the world of work and leisure by helping our pupils to achieve satisfactory personal relationships.

11. To foster corporate community ideals for the development of the whole child physically and morally as well as on the side of learning, attracting the loyalty of pupils long after schooldays are over.

Leading staff, pupils and parents to the accomplishment of these defined objectives, based on rational decisions derived from experience and adequate information and combined with carefully planned organisation, is in my view the true process of management.

Recommended Books and Reading

Edmonds, E. L. (1968) The First Headship.
Basil Blackwell, Oxford.

Taylor, G. et al (1970) The Teacher as Manager.

Times Educational Supplement : (14. 7. 72). "Don't shoot the head". B. F. Rice.

Times Educational Supplement : (29. 9. 72). "Is the head obsolete?". Anne Chisholm.

APPENDIX

THE ABRAHAM DARBY SCHOOL

---- SCHEME OF RESPONSIBILITIES ----
1970

All remunerated teaching posts are in capitals

Elements		
1. ADMINISTRATION :	Deputy Head, Heads of Upper and Lower Schools, Bursar.	
2. DISCIPLINE AND WELFARE :	Senior Mistress, Senior Master.	
3. PASTORAL :	6 Housemasters - 4 of whom rotate years 1 - 4 with their groups.	
4. ACADEMIC :	Head of Departments	
	English (Communication)	
	Project Development (Resources Centre)	
	Mathematics	
	Physical Science	
	Technical Studies	
	Life Sciences (inc. Geology, Anthopology, Astromony)	
	Chemistry	
	Design	
	Music	
	Drama	
	Physical Education	
	Home Economics	
	Languages	
	Commerce	
	General Education	
	Moral Education	
	History	
	Geography	
	Sociology	

1. UPPER SCHOOL - YEARS 5, 6, 7, 8

HEAD OF UPPER SCHOOL

admissions to yrs. 5,6,7,8.
courses and timetables
progress of students
careers
administration of external exams.
admission to tertiary institutes
conduct of students

SENIOR MASTER

SENIOR MISTRESS

CARTER HOUSE (6th)
YAPP HOUSE (5th)

assemblies
social activities
records
conduct and progress
careers
interviews with parents
attendance

no registration for 6th formers

Tutors

2. THIRD & FOURTH YEARS

HEAD OF MIDDLE SCHOOL

- (a) admission of pupils to 3rd & 4th years, moral, intellectual and social progress of 3rd & 4th yrs.
- (b) conduct and dress
- (c) interviews with parents
- (d) compilation of records
- (e) attendance
- (f) collection of careers material & dissemination to housemasters
- (g) administration of internal tests and exams
- (h) administration of Middle School area
- (i) homework arrangements

ENIOR MISTRESS — irls' welfare ealth, inter- iewing parents

SENIOR MASTER

HOUSEMASTERS

(There are 2 Houses each of 200 pupils)

- (a) House assemblies
- (b) House social activities
- (c) House clubs and hobbies
- (d) intellectual, moral & social progress of pupils
- (e) compilation of records
- (f) attendance
- (g) conduct and dress
- (h) interviewing parents about progress and discipline. This will involve evening visits
- (i) directing & co-ordinating the work of Tutors
- (j) Careers

Note: Tutors and Housemasters move through the school with their groups from Year 1 to Year 4

Tutor

- (a) Responsible for tutorial group
- (b) Registration & Attendance
- (c) moral, social and intellectual progress of pupils.
- (d) collecting & receiving information about pupils from specialist teachers.

3. FIRST AND SECOND YEARS

HEAD OF LOWER SCHOOL
(Respondible to Headmaster)

- (a) links with Primary Schools & induction arrngmts , admissn & placing of new pupils in years 1 & 2.
- (b) moral, social & intellectual progress of years 1 & 2
- (c) conduct and dress
- (d) attendance
- (e) interviewing parents
- (f) Lower school hobbies & clubs
- (g) compilation of records
- (h) admin. of Lr. School area.
- (i) supervision of all school duties
- (j) homework arrangements

SENIOR MISTRESS (Girls' welfare interviewing parents)

SENIOR MASTER

HOUSEMASTERS

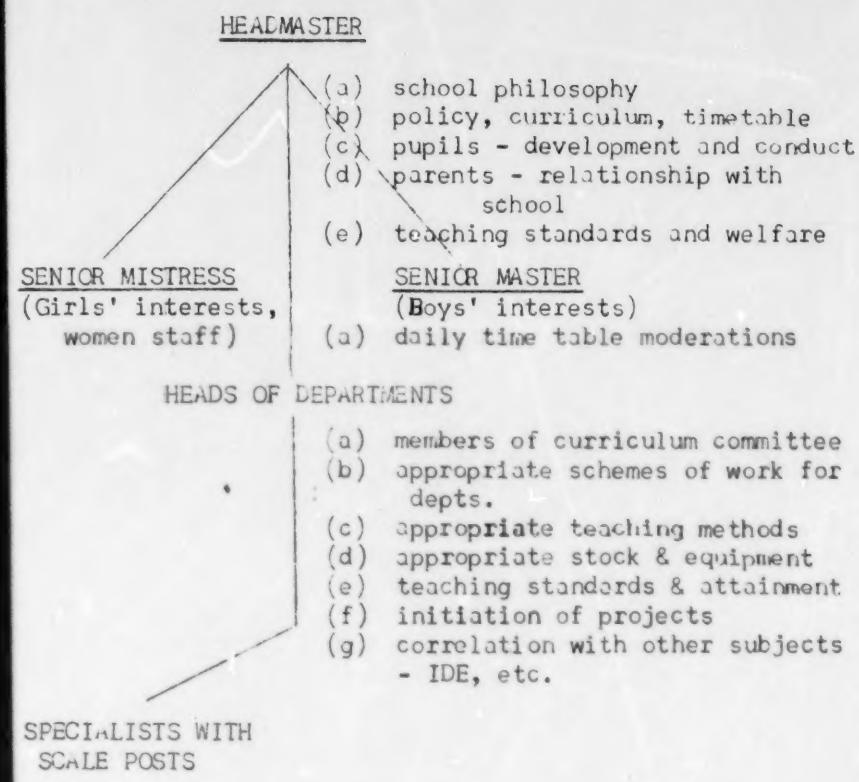
(There are 2 Houses each of 200 pupils)

- (a) moral, social & intellectual progress of pupils
- (b) conduct and dress
- (c) registration & attendance
- (d) collation and recording of information from specialist teachers

Form Tutors

- (a) responsible for tutorial gp.
- (b) Registration and attendance
- (c) moral, social & intellectual progress of pupils
- (d) collecting and receiving information about pupils from specialist teachers

4. ACADEMIC STANDARDS:


HEADMASTER
(a) school philosophy
(b) policy, curriculum, timetable
(c) pupils - development and conduct
(d) parents - relationship with school
(e) teaching standards and welfare
SENIOR MISTRESS
(Girls' interests, women staff)
SENIOR MASTER
(Boys' interests)
(a) daily time table moderations
HEADS OF DEPARTMENTS
(a) members of curriculum committee
(b) appropriate schemes of work for depts.
(c) appropriate teaching methods
(d) appropriate stock & equipment
(e) teaching standards & attainment
(f) initiation of projects
(g) correlation with other subjects - IDE, etc.
SPECIALISTS WITH SCALE POSTS

5. DISCIPLINE & WELFARE

SENIOR MASTER - SENIOR MISTRESS

(i) daily timetable moderation

(ii) standards of dress and behaviour throughout school

(iii) co-ordination of all outgoing boys and girls' activities (incl.Duke of Edinburgh Award)

(iv) Newsome and careers

(v) with Head of Dept. - moral education and relationships

(vi) oversight of all specific boys'/ girls' duties (P.E., Crafts, H.Economics)

6. VISITS & LEAVE OF ABSENCE

(i) Leave of absence must be sought from the Headmaster.

(ii) Permission to take parties out of school must be sought from the Headmaster, and if this involves alteration in the time-table 10 days notice must be given.

7. ADMINISTRATION

	Deputy-Head	:	dining arrangements
	Bursar	:	moneys purchases requisitions stock routine administration fabric
	Secretary	:	Headmaster
2	Clerical assistants		

8. TECHNICIAN ASSISTANCE

2	Laboratory technicians	:	maintenance and construction of apparatus in Science and Maths laboratories
	Workshop Technician	:	maintenance of tools and fabrication where required
1	Resources Technician	:	maintenance of all hardware
1	Resources Typist/ Librarian	:	to work in the resources area

FACTORS AFFECTING THE CHOICE OF HEARING AIDS AND THEIR EFFICIENCY IN USE.

Alan Huntington. September, 1972.

Ideally the fitting of a hearing aid should mean that the wearer experiences the reception of amplified sound in a form as free as possible from distortion. Admittedly the ingredients that make up his sonic environment may differ from those that characterise that of the normally hearing, in the proportions in which the hearing aid transmits them for example, but the aim should be to get these varying ingredients to merge so as to make his sonic environment as informative and as pleasurable as possible.

And if one were to choose among sounds and elevate some because of their greater importance, it would probably be agreed that the sounds of human speech should take pride of place. It is the transmission of speech sounds that must be most carefully considered when fitting a hearing aid.

For deafened persons it is utterly advantageous for them to hear these sounds as faithfully reproduced as possible in order to remain in touch with previous auditory experience and to monitor their own utterances. For the born deaf too it is equally to their advantage to hear the best possible speech patterns so that they may attempt, as far as possible, to imitate these and so develop intelligible spoken language.

In the case of these subjects who have become deaf, they can say, provided an aid is fitted reasonably quickly and memory of the sound of spoken language is not fading, whether what they hear through their aid resembles tolerably well what they used to hear before impairment occurred. And to confirm this one can test them with lists of words via a selection of aids, at differing intensity levels, in varying acoustic conditions.

With those persons who were born deaf one can again utilise speech tests of hearing provided that they have some linguistic attainment and can respond to the stimuli in a reliable fashion, so that their responses when wearing different aids at different control settings can be compared quantitatively.

With young children, however, language is as yet only in its beginnings and auditory experience of language may be virtually non-existent if the hearing loss is severe. Speech tests, then, are out of the question. In these circumstances how does one go about selecting an aid from the scores of models that are available?

In such cases one may have to have recourse to prescribing a hearing aid from a purely theoretical standpoint: basing selection on a consideration of the child's residual hearing for pure tones, and the relation of the pure-tone audiogram to speech as it is amplified by the gain of a particular hearing aid; by looking at the audiogram together with the effect of a given hearing-aid on the incoming speech-signal. Thus, it is necessary to be able to look simultaneously at the audiogram and amplified speech.

USE OF THE SPEECH AREA

Some five years ago Arthur Boothroyd frequency-analysed tape recorded words that he had previously prepared for use in speech audiometry. He sought to establish what frequencies were present in conversational-level speech and in what strength these frequencies appeared. He plotted points of maximum intensity over a given frequency range and charted as a result the area on a pure-tone audiogram format that is shown in Figure 1. This gave, said Boothroyd, "an approximate indication of the spectral content of the speech signal".

It will be noted that a normal pure tone threshold lies, in the middle frequency range (500 Hz. to 3KHz.), about 30 dB above the top of this Speech Area. This obtains when listening to 65 dB speech in perfect acoustic conditions. When these conditions are adverse, however, and hearing is impaired as a result, the gap between the consequently lowered threshold and the top of the Speech Area will be narrowed, though the intelligibility of the speech signal may be only slightly impaired as far as normal hearing people are concerned on account of the redundancy operating in the linguistic experience of these listeners.

A second point to note is the 30 dB difference, again in the central part of the Speech Area, between the quietest and loudest components of conversational speech.

Some of these facts were discovered long before Boothroyd undertook his research. The point is that Boothroyd succeeded in presenting them in a very convenient and practical form.

LOWERING THE SPEECH AREA.

The aim in fitting a hearing-aid is to amplify this Speech Area - to lower it on the audiogram form - so that the deaf person's pure-tone threshold lies clear of the top of the Speech Area. If this is not possible an attempt must be made to approximate as closely as possible to this position.

What happens now if we amplify this Speech Area by the gain of, for example, a Medresco hearing-aid, an OL57? Figure 2 illustrates what occurs in theory. The maximum gain of this particular aid was:

Hz.	250	500	1K	2K	3K	4K
dB.	45	53	56	65	61	58

The top and bottom limits of the unamplified Speech Area were lowered in accordance with these gain figures e.g. at 500 Hz. the measured gain of 53 dB was added to the 30dB point on the upper edge of the Speech Area lowering this to 83 dB and to the 60 dB point on the lower confine of the Speech Area bringing this latter point down to 113 dB, and so on.

The lowered Speech Area is different in shape from the unamplified Speech Area because the gain of the aid is not even right across the frequency range. The possible effect of this will be discussed a little later.

In Figure 2, the maximum output response of this OL 57 has been plotted (after correcting it from SPL to clinical reference level) and it will be observed that this curve slices off the lower high frequency portion of the Speech Area. This signifies that, using maximum gain, the loudest components of the speech signal above about 1000 Hz would be overloading the aid and causing some distortion though it would be

difficult to pronounce on the precise effect of this amount of distortion on the intelligibility of the amplified speech transmitted by this aid. To avoid overloading one would have to turn down the volume control so that, as shown in Figure 3, the lower edge of the Speech Area just touched the maximum output curve.

THEORETICAL FITTING OF AIDS

It is now proposed to simulate the effect of putting that aid on a deaf child (D.H.). This is achieved by superimposing D.H.'s pure tone audiogram on the lowered Speech Area and is illustrated in Figure 3. With this type of aid provision D.H. would enjoy reception of amplified speech over a relatively wide range of frequencies (below 500 Hz. to beyond 3000 Hz.).

In fact, D.H. did wear an OL57 with volume control set in the 3 - 3½ region for several years. Last year she was fitted with an ear-level aid, OL 67, and the theoretical effect of this is portrayed in Figure 4. In relinquishing the OL 57 she is restricted to a a narrower range of frequencies via the OL 67 but seems to interpret quite well the signals she receives via this postaural instrument. Its limitations, however, as far as cosmetically conscious deafer adolescents are concerned can be clearly seen.

Fig. 5 demonstrates how hopelessly inadequate the OL 67 would be if worn by D.P. The six diagrams that follow (Figures 6 - 11) show the theoretical effects of trying various aids on this same child.

Figure 6 shows D.P. with an OL 57 (OL 575 rec.). With this aid the loudest sounds of a 65 dB speech input would be only about 15 dB above his threshold, assuming quiet listening conditions, first-rate batteries and a mould that could cope with volume setting 5. Even so D.P. would be prevented from enjoying amplification above 2KHz since his pure tone threshold lies below the maximum output potential of the aid.

Figure 7 depicts the theoretical effect of the Ol 58c (OL 375 rec.) on D.P.'s hearing loss. The maximum output curve has been drawn in and the volume control adjusted so that no overloading took place. Even with this provision the quietest sounds of speech would be about 10 dB below his threshold.

Figures 8, 9, 10 and 11 all simulate D.P.'s wearing commercial aids with volume controls adjusted so that, as in Figure 7, overloading is just avoided.

The aids whose performances are portrayed in Figures 8 and 9 are both products of the same manufacturer, the first offering, according to the manufacturer's leaflet "super power with wide frequency band", whilst the second, in Figure 9, is designed "for low-tone reproduction".

Both the aids in Figure 10 and Figure 11 incorporate ceramic microphones enhancing transmission of low frequencies. Of the four commercial aids illustrated, and indeed of all seven aids (Figures 5 - 11) used in conjunction with D.P.'s audiogram, the most useful potentially would be that shown in Figure 11 where alleviation of the loss at 2000 Hz. is superior to that of the others, whilst low frequencies are also catered for.

Gain figures for use in this type of prediction can usually be obtained from hearing aid leaflets and brochures since very few of the world's deaf schools have their own B & K test equipment. Maximum output figures too are generally included in the data offered by such literature. Care here must be taken to convert the maximum output figure (usually quoted in dB at 1000 Hz) from SPL to the Clinical reference level so that this can be put on the audiogram form. This is achieved by subtracting 7 dB from the SPL figure at 1KHz. .

FEASIBILITY OF THIS APPROACH.

In the course of this paper the word "theoretically" has cropped up frequently. "In theory", this is the Speech Area provided by this aid when the volume control is at maximum; "theoretically" this child should be getting undistorted speech reception over this range of frequencies.... and so on. Is this theory of any practical use, however? Is it practically effective?

The truth, of course, is that much experimental work still needs to be done over a protracted period before its value is really proven. The writer, however, has had experience of three children wearing the same aid fairly consistently over the past four years; aids prescribed on this theoretical basis. The aids have been worn "fairly" consistently; the three children all attended a residential school and do wear their aids consistently in school. At home, one does, one does not, and the practice of the third child is in doubt.

Figure 12 shows the better ear audiograms of the three children as they were taken four years ago. They remained steady at that level until last year.

The best National Health provision at the time was the OL 57 which, particularly in the low frequency area, would have been very inadequate. A commercial aid was selected that would provide high amplification especially in the low frequencies: the same aid for each of the three as it happened.

Figures 13, 14 and 15 show the effect of their respective aids on 65 dB speech and both their current audiograms (stable now for a year) and their previous (zig-zag) thresholds (steady at that level for three years) are superimposed.

None of these children has, as yet, been taught any speech sounds artificially. What they have acquired has been through the medium of watching and listening. Here are some brief notes on some of their attainments to date.

L.P. appreciates the existence of varying intonation patterns and imitates normal intonation well. She has a well-developed sense of rhythm. Although she can copy most vowels and diphthongs when watching as well as listening she cannot discriminate between <u>any</u> pair of vowels using hearing alone (e.g. dog/dig is too difficult because of her very severe loss in the second formant region of /I/).

The same restriction on vowel discrimination by hearing alone applies also in the case of K.B. She cannot cope with the tea/too distinction unless lipreading is introduced.

L.L. on the other hand with a relatively higher threshold in the higher frequencies (75 dB @ 2KHz, 70 dB. @ 4KHz) can, by hearing alone, demonstrate very good vowel discrimination.

As far as consonant discrimination by hearing alone is concerned, the following table shows what they can do using their body-worn aids in quiet conditions.

CLUES FROM :	L.P.	K.B.	L.L.
Voicing Manner of articulation Place of articulation	she/be* ✓	✓	✓
Voicing Manner	too/zoo ✓	✓	✓
Manner Place	back/jack ✓ peep/cheap ✗		back/jack ✗ peep/cheap ✓
Voicing Place	go/toe ✓	✗	✗
Voicing	Paul/ball ✓	✗	✗
Manner	sheep/cheap ✓ sip/tip ✗	✗	✓
Place	pen/ten ✓ pea/key ✓ tea/key ✓	✗	✗

* = can achieve score of 8 out of 10 when two words spoken in random order.

In the case of these three children it is felt that the original choice of aid was a reasonable one. The difficulty is that one cannot say more than that. It is not possible, for certain, to say that they would have fared worse or as well or better if issued with a different aid four years ago. It is unlikely that they would do better if they changed aids now. One would have to allow a reasonable familiarisation period with a new aid - several months probably - at the end of which they may be worse off, which would be a tragic waste of time at this stage.

CONSISTENT USE OF THE AID.

Consistency in the wearing of an aid is a factor that should be heavily underlined. The Speech Area - amplified by the gain of the aid worn by each of these girls is different in shape from the unamplified Speech Area; it is distorted. BUT there is no good reason why, if they consistently hear this "brand" of speech, they should not learn to interpret the particular clues provided by the aid in question. There is no justification whatsoever, on purely administrative grounds, for taking an aid from a child when he moves from one school department to another. This practice, where it exists, should be eradicated if the childs interests are to be served.

KEEPING THE AID EFFICIENT

Having then selected a hearing aid (by whatever means) let us now turn to maintaining its efficiency in actual use.

It is not proposed to spend much time on obvious factors :

(a) that leads should be in good condition;

(b) that an aid should be linked to a receiver designed for that aid. Mismatches, though still perhaps sounding reasonable to normal listeners, can play havoc with frequency response. They may too shorten the life of the receiver or of the aid.

(c) that batteries should be changed in the aids of deafer children when they reach the 1.25 volt level. This means, where the aid is worn all the time at a high volume setting that batteries should be changed more frequently than once a week. Once very four days is necessary in many cases.

THE IMPORTANCE OF THE EARMOULD.

These things are known. The remaining fundamental link in the chain is the earmould itself, a component which, when faulty, is not quite so easy to replace in most schools at the lead, battery or receiver. And yet this is easily as vital as any of the others.

The Speech Areas depicted in the foregoing diagrams are based on testing procedures that do not take earmoulds into account; though a well-made, well-fitting mould need not alter their shapes very much. A poor mould would, radically slicing down an aid's low frequency response, robbing a deafer child of gain precisely in the area in which he may most need it, below 1KHz.

What degree of satisfaction is there in the schools represented at this Conference with the earmoulds that children wear? If an aid whistles is it possible to get a new mould made rapidly? Or is it easier to turn down the volume control than to get a good new mould made?

Some four months ago a pilot study on the current state of earmoulds was carried out in a small Lancashire School for hearing-impaired children where it was discovered that on average, OL 57 aids were incapable of delivering more than 44 dB gain (at 1KHz) due to leaking moulds, before acoustic feedback set in and that, despite its greater

gain and output potential, the OL 58c suffered in the same way, affording no more gain than the OL 57.

Subsequently, Professor Taylor asked that a more comprehensive survey be undertaken involving more schools so that, if possible, a general picture of the state of earmoulds in the north-west could be drawn, backed by hard figures. An account will now be given about this survey that Mr. Powell, a Lecturer in the Education of the Deaf, and the writer, have just completed.

EARMOULD SURVEY : July - Sept. 1972

There were two principal aims in the undertaking of the survey :

(a) to ascertain what level of acoustic gain was being enjoyed by hearing aid users in schools for deaf children before the onset of acoustic feedback.

(b) to find out whether one type of mould was superior in providing a more effective seal and so preventing acoustic feedback.

Ten schools were chosen including a day school for deaf children a day school for partially hearing children, a residential school for partially hearing children and a number of residential schools for deaf children.

Within each school a random sample was taken comprising 25% of the children whose names were on the school roll. Testing commenced with the youngest children and finished with the oldest, every fourth child being tested from alphabetically-arranged class lists. The total number of children tested was 272 (138 boys, 134 girls).

Where children were fitted with two earmoulds, both moulds were tested. Of the 272 subjects, 121 wore two moulds, whilst 151 had only one. Thus, a total of 393 earmoulds were examined.

Three body-worn aids were used in all the tests: an OL 57 (OL 575 rec.), an OL 58c (OL 575 rec.) and a commercial aid. The aids were both readily available in the University Department of Audiology and the two N.H.S. aids were known, from practical experience, to be widely used in schools for hearing-impaired children.

Response curves of these aids at each half-setting on the volume control were produced by Mr. P. Moore, Chief Technician in the Department of Audiology, using Brüel and Kjaer equipment.

TESTING PROCEDURE.

Each child tested was seated facing the tester who, after examining the child's earmould to ensure that the channel was clean and free from any obstruction, attached the earmould to the receiver of the OL 57 and inserted the mould in the child's ear. Extreme care was taken at this juncture to fit the mould as snugly as possible in the ear, making sure in the process that no hair was trapped by the mould. The microphone of the aid was held centrally on the child's chest (in a position where it would be normal and advisable for the child to wear the aid), the aid switched on and the volume control turned up progressively whilst moving the child's head smoothly from side to side through approximately 180^{o} and in varying planes. (This standardised procedure simulated the sort of head movements the child might be expected to make in normal everyday activities: turning sideways to look or talk, looking down to read or draw, etc.).

When acoustic feedback occurred, the volume was not increased further. It was then reduced by one half setting to eliminate feedback. To ensure that this last setting did not produce feedback, the child's head was once again moved in the above-mentioned manner. The same procedure was then adopted using the OL 58c and following that the commercial aid.

Throughout the testing, a close check was kept on the state of the batteries in the control aids. Once the on-load voltage reached 1.5 volts, the battery was changed.

ANALYSIS OF DATA.

When the 25% sample of children in a school had been tested, the mean maximum gain at 1kHz enjoyed before the onset of feedback was derived together with the standard deviation. Tabulated below are the means and standard deviations for each of the ten schools and for all schools taken together.

MEAN MAXIMUM GAIN AT 1kHz ENJOYED BEFORE ONSET OF FEEDBACK.

SCHOOL	OL 57		OL58c		Commercial Aid	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
	dB	dB	dB	dB	dB	dB
A	53.6	5.7	52.2	6.5	57.5	4.6
C	52.8	4.9	52.0	5.5	58.1	2.9
D	51.1	4.5	48.1	4.6	61.8	4.8
E	50.5	6.0	47.6	5.0	54.0	5.2
F	49.8	5.9	47.3	4.7	52.6	3.8
G	48.0	5.1	44.9	3.9	53.1	4.1
H	47.0	5.1	45.2	4.2	57.6	3.5
J	46.3	3.8	44.1	3.4	57.5	2.3
B	46.1	6.5	45.0	4.6	51.1	5.3
K	46.0	5.5	43.8	3.9	51.5	4.9

	OL57		OL58c		Commercial Aid	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
ALL SCHOOLS	48.4	6.0	46.2	5.1	55.0	5.2

DIFFERENCES AMONG THE THREE TEST AIDS

It will be observed that in each school and in all schools combined, the main gain at 1kHz before feedback was higher in the case of the Ol 57 than in that of the OL 58c and that the commercial aid was superior to the other two aids. When subjected to t-test analysis these differences proved to be statistically significant at the 1% level.

Figure 15 shows the comparative responses enjoyed in practice on the three test aids before the onset of feedback (curves based on mean gain for all schools at 1kHz).

Although the commercial aid did allow more gain (at 1kHz) to be enjoyed before feedback than did the other two aids yet even with this aid only 57% of the children tested could enjoy more than 55 dB

gain (at 1kHz) (despite the aids potential of 75 dB maximum gain) and less than 2% could enjoy maximum output (134 dB SPL) assuming an input of 70 dB SPL. In the case of the OL 57 only 12% of the children could enjoy gain in excess of 55 dB (at 1kHz) (despite this aid's potential maximum of 67 dB gain) and only 2% could listen at 120 dB SPL assuming an input of 60 dB SPL.

WHICH CHILDREN COULD BENEFIT?

To give some general indication of what this implies, the 325 ears for which audiograms were available were divided into five groups according to severity of loss. Mean audiograms were drawn for:

(i) losses at 1kHz less than 70 dB.
(ii) " " " between 70 dB. and 79 dB.
(iii) " " " " 80 dB. and 89 dB.
(iv) " " " " 90 dB. and 99 dB.
(v) " " " in excess of 100 dB.

In Figures 17, 18 and 19 these mean P.T.A.s are displayed superimposed on Speech Areas amplified (respectively) by the effective gain (at 1kHz before onset of feedback) of the OL 57, OL 58c and the commercial aid. Thus, for example, from Figures 17 and 18 it will be seen that, theoretically, it is only those children whose mean P.T.A.s fall in the first two groups (< 70 dB and 70-79 dB losses at 1kHz) who can in practice benefit substantially from the OL 57 and OL 58c used in the tests. (This is based on an assumed input of 65 dB SPL).

These are depressingly poor performances when the very severe losses of the children in groups (iv) and (v) are taken into account. (Over half the ears tested had impairments greater than 90 dB at 1kHz: 90 - 99 dB: 53 ears; 100 + dB: 146 ears).

Attitudes towards provision of commercial hearing aids varied among the schools visited. At one extreme the view was expressed that since commercial aids offer higher gain which results in acoustic feedback because of inefficient moulds it was disadvantageous to deviate from the practice of equipping the children with less powerful National Health aids. At the other pole it was contended that deafer children need gain higher than that afforded by the Medresco aids. In consequence they need moulds of improved quality designed to handle this higher gain. In two schools the swing was towards commercially manufactured earmoulds.

One of these schools put pressure on the local commercial aid distributor, contracting to purchase certain commercial makes provided that adequate moulds were supplied with the aids.

EARMOULDS: DISTRIBUTION AND SUPPLY

Tabulated below is the distribution of earmould types among the 25% sample of children in the ten schools:-

DISTRIBUTION OF EARMOULD TYPES - %

SCHOOLS	NHS % PINK INSTANT	NHS % HARD CLEAR	COMMERCIAL % HARD CLEAR
A	94.7	5.3	0
C	68.2	22.7	9.1
D	69.6	0	30.4
E	1.8	0	98.2
F	20.6	79.4	0
G	63.3	24.5	12.2
H	91.3	6.5	2.2
J	0	100	0
B	51.2	48.8	0
K	14.6	85.4	0
ALL SCHOOLS	39.9	42.3	17.8

As far as manufacture of earmoulds was concerned, there were three principal sources of supply :

(a) moulds were made at the local hospital or hearing aid clinic.

(b) they were made commercially.

(c) moulds of the pink cold cure variety were made on school premises by a school technician or, in some instances, by a member of the teaching staff.

Some schools, (e.g. H and J) had virtually only one source of supply, whilst others (e.g. G) had children equipped from all three sources.

INTERACTION BETWEEN TEST AIDS AND MOULDS

There was no significant interaction between the moulds and the aids used in the tests. This indicates a high quality mould performed consistently well, regardless of which test aid was used.

DIFFERENCES BETWEEN HARD CLEAR AND COLD CURE MOULDS

The pink cold cure mould proved superior to the hard clear type in allowing children to experience higher gain at 1kHz before feedback set in. Below are the mean maximum gain figures at 1kHz enjoyed before feedback (all schools combined).

MOULD TYPE	OL 57	OL 58c	Commercial Aid	All Aids
Hard clear	47.7dB	45.1 dB	54.1 dB	49.0 dB
Pink cold cure	49.4 dB	47.8 dB	56.4 dB	51.2 dB

When t-tests were applied to these figures, the difference between the pink cold cure mould and the hard clear type showed itself to be statistically significant at the 1% level. (When individual schools' data were analysed statistically with respect to mould type superiority, in no school did the hard clear variety prove to be superior to the pink cold cure mould).

Thus there have appeared :

(a) significant differences among the three aids used in the experiment.

(b) significant differences between the two types of mould in use.

INDIVIDUAL SCHOOLS' PERFORMANCES COMPARED

Finally steps were taken to ascertain whether there were marked differences among the ten schools that took part.

Each school in the survey was compared with every other school taking part to see if the mean differences in the amount of gain at 1kHz enjoyed by the children were significant statistically (taking all three test aids into account).

The following table illustrates the findings. If the overall performance of the aids in a school in the vertical left hand column is superior (regarding feedback levels) to that of a school in the top horizontal row, a plus-sign is entered in the appropriate square. If inferior, a minus-sign is entered. N.S. indicates no significant difference between the two schools compared.

(One plus sign = significant at the 5% level.
Two plus signs = significant at the 1% level).

	G	F	H	E	J	D	K	A	B	C
G		-	-	-	N.S.	-	++	-	+	-
F	+		N.S.	N.S.	N.S.	-	++	-	++	-
H	+	N.S.		N.S.	N.S.	-	++	-	++	-
E	++	N.S.	N.S.		+	-	++	-	++	-
J	N.S.	N.S.	N.S.	-		-	++	-	++	-
D	++	++	++	++	++		++	N.S.	++	N.S.
K	-	-	-	-	-	-		-	N.S.	-
A	++	++	++	++	++	N.S.	++		++	N.S.
B	-	-	-	-	-	-	N.S.	-		-
C	++	++	++	++	++	N.S.	++	N.S.	++	

Looking at the above table some schools (in the left hand column) do stand out: A, C and D notably. It is significant that all three of these schools, where better performance was evidenced have a technician on the premises whose work includes the making of cold cure moulds.

School E came forth on the list and in this school 98% of the childrens' moulds had been made commercially.

OTHER OBSERVATIONS

In passing, note was taken of the incidence of such items as cracked receivers, missing washers, etc. A relatively painful experience, even from the researcher's standpoint (!), was the discovery of one child wearing his right mould in his left ear because his right ear was sore. On a more serious plane was the frequent occurrence in some schools of mismatched receivers. In the table following the percentage incidence of this fault is listed against the schools.

PERCENTAGE INCIDENCE OF EARS WITH MISMATCHED RECEIVERS

SCHOOL	%
D	0.0
K	0.0
C	0.0
G	2.0
H	2.2
F	2.9
A	5.3
B	7.3
E	23.6
J	23.8
ALL SCHOOLS	8.9

Another disturbing feature was the frequency in some schools with which recourse was had to a box of spare moulds. As a very temporary measure this practice may be justifiable, but there is the grave danger that once a child is "equipped" he may get missed when the next batch of new moulds is made. "Make sure that the mould she is wearing is her own" is a good maximum even if bordering on the plagiaristic!

SUMMARY

To sum up then, the writer has looked at a theoretical way of choosing hearing aids: a method that involved finding the gain of an aid, lowering Boothroyd's Speech Area in accordance with this gain and seeing finally where the P.T.A. lay in relation to the lowered Speech Area.

In the second section, "efficiency in use", very heavy emphasis was laid on the efficient functioning of the earmould if gain generally is not to suffer and low frequencies in particular are not to be lost.

But in practice, from the survey described, moulds generally are currently a very restrictive influence, forcing down gain to a level that is of little use to our deafer children.

Some key factors emerge :

(a) A commercial aid, per se, need not produce more feedback. The test aid did not. It did offer higher gain before feedback.

(b) Pink moulds are superior (in allowing enjoyment of a higher gain) to hard clear moulds.

(c) Schools with technicians are catering more effectively in the provision of moulds than those schools that rely on local hospitals.

What seems to stand out particularly is that traditional N.H.S. provision of hard clear moulds is failing to provide what the children need; e.g. schools J and K with heavy dependence on N.H.S. hard clear moulds came very low on the schools' table, whilst schools (such as A, C and D) that have abandoned N.H.S. arrangements (apart from collecting N.H.S. cold cure kits) and have their own technicians, or school E, relying almost entirely on commercial moulds, are getting better results.

Confronted by these facts it would seem that there is little room for complacency as far as auditory provision for deaf children is concerned.

[The writer would like to express very sincere thanks to those people who helped to make the earmould survey possible in the limited time available: the Headteachers and staffs of the ten schools; Mr. Moore, Chief Technician in the Department of Audiology; Pauline Barry who prepared raw data for the computer; and Bill Hine, Lecturer in Education of the Deaf, for his help in designing the experiment and interpreting results.]

REFERENCE :

BOOTHROYD, A. The selection of hearing aids for children. Unpublished Ph.D. thesis, University of Manchester, 1968.

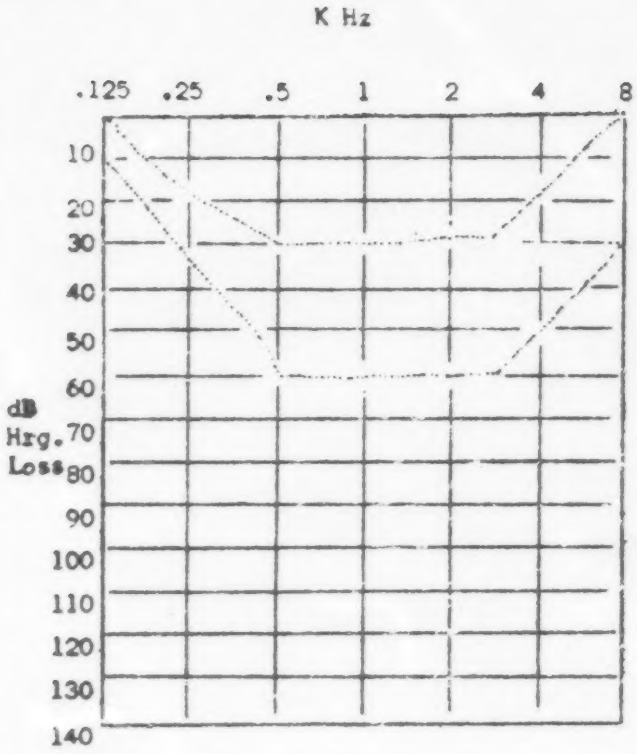


Fig. 1

Boothroyd's unamplified 65 dB Speech Area.

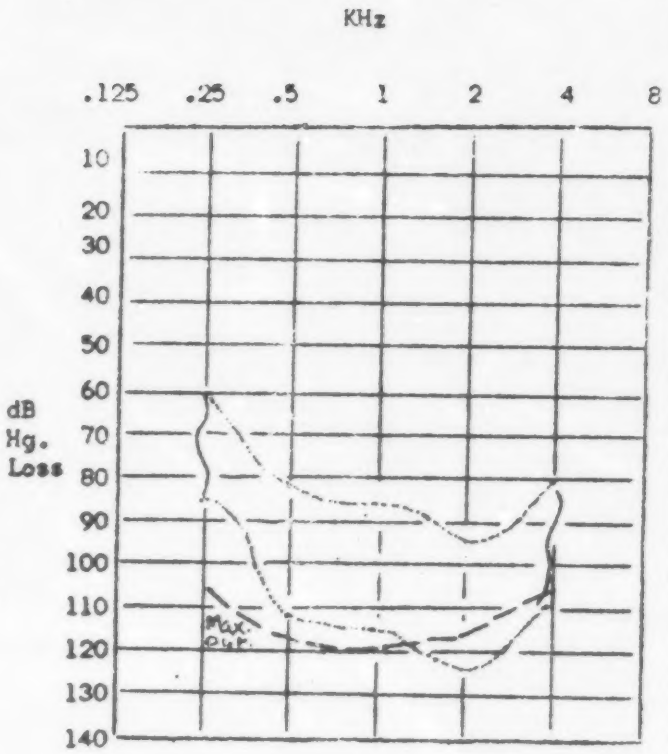


Fig. 2

65 dB Speech Area amplified by gain of OL 57 aid (OL 575 rec.).
Maximum volume

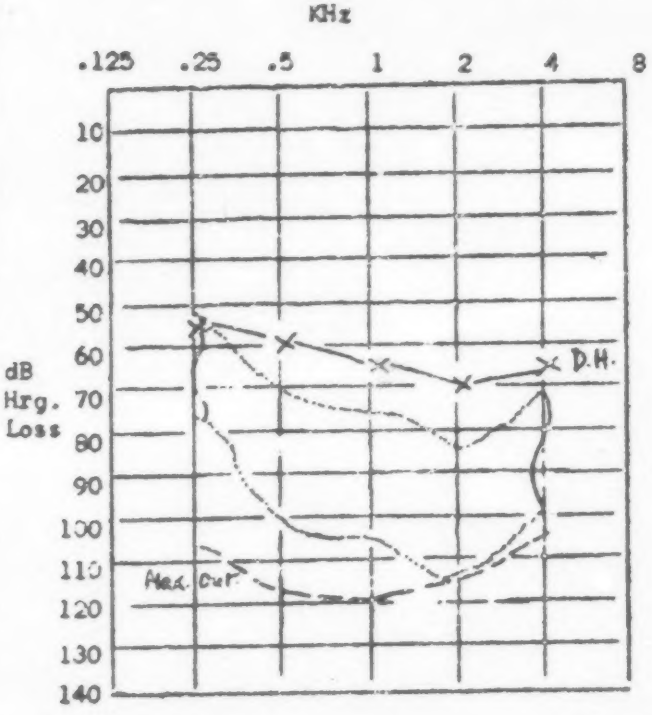


Fig. 3

Theoretical effect of D.H.'s wearing an OL 57 aid (OL 575 rec.) with 1kHz gain approx. 10 dB below maximum.

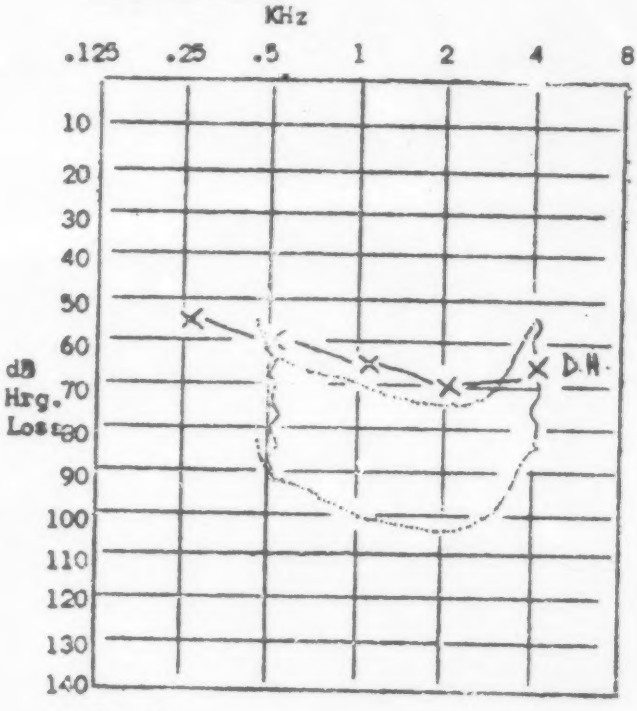


Fig. 4

Theoretical effect of D.H.'s wearing an OL 67 aid (OL 695 rec.).
Maximum volume.

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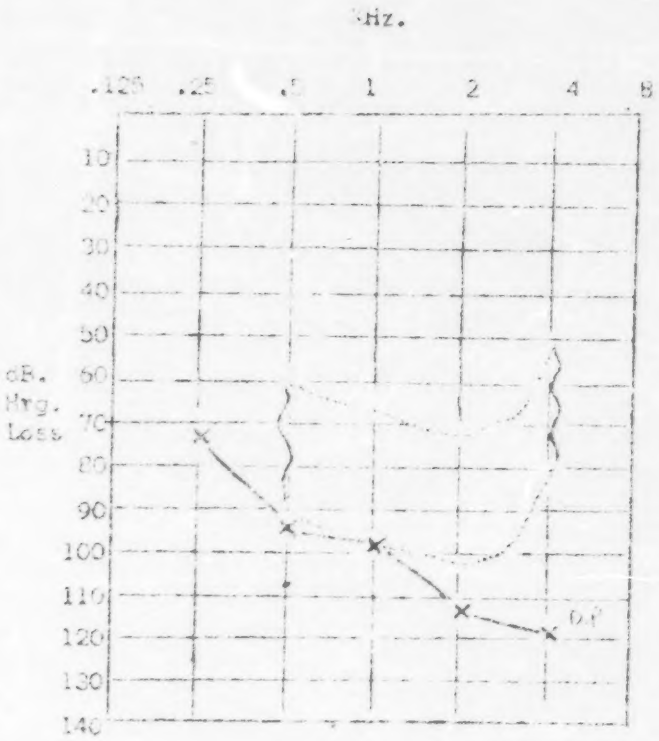

Fig. 5

Theoretical effect of CL 67 (OL 695 rec.) (volume control at maximum) on D.P.

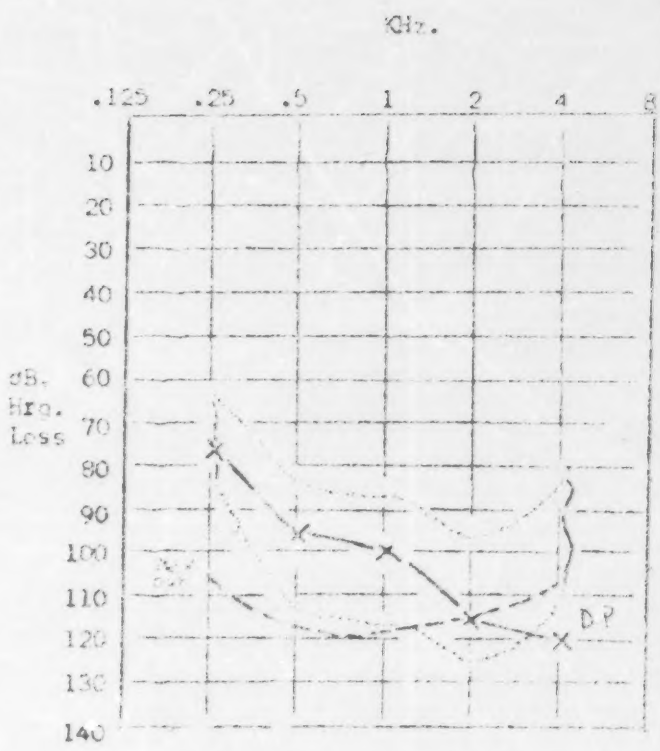

Fig. 6

Theoretical effect of OL57 (OL 575 rec.) (volume control at maximum) on D.P.

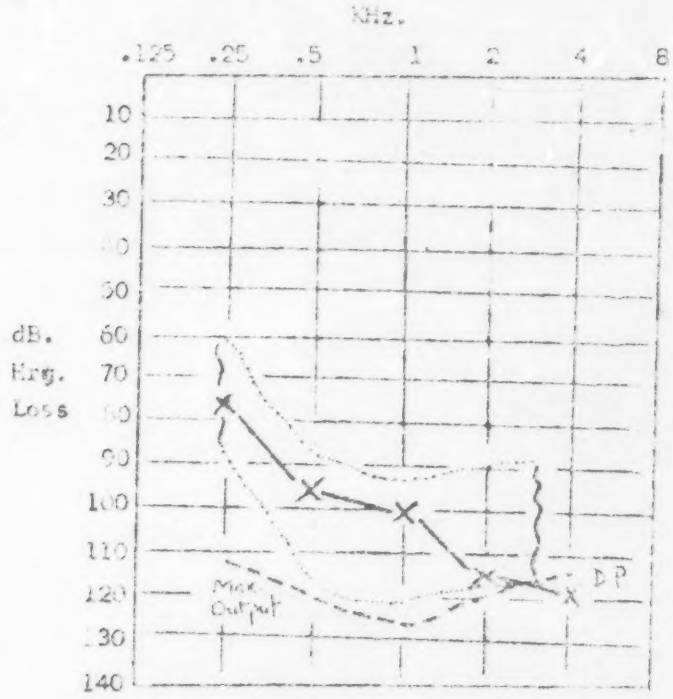

Fig. 7

Theoretical effect of OL 58c (OL 375 rec.) with 1KHz gain approx. 5 dB. below maximum.

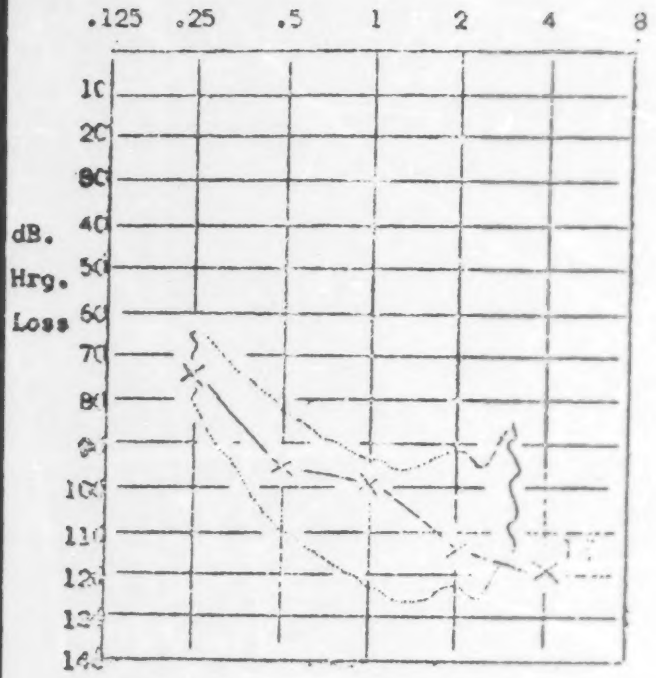

Fig. 8

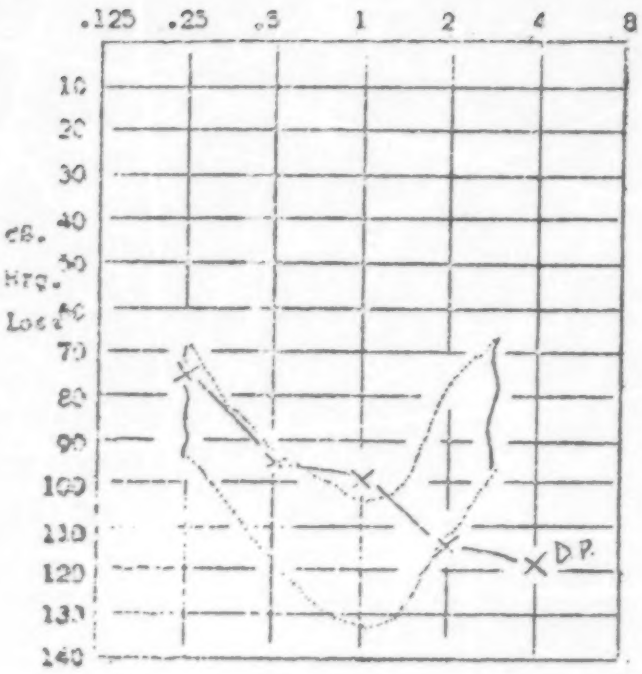

Fig. 9

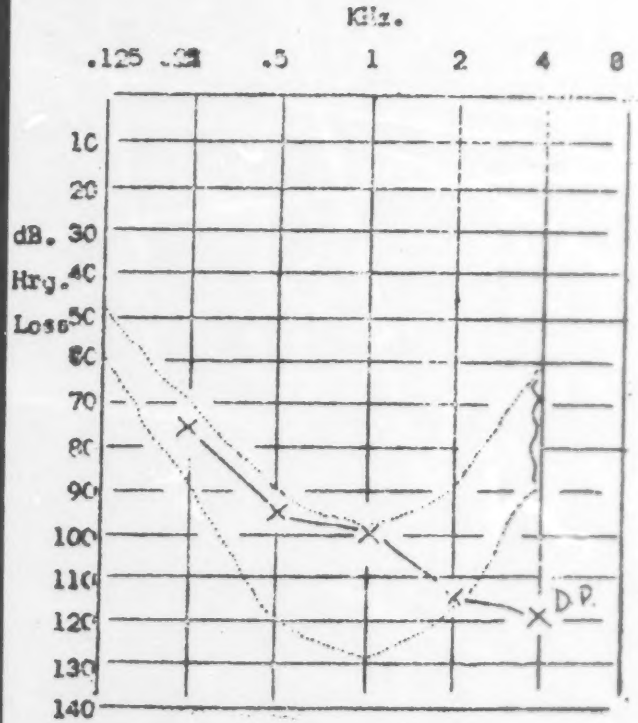

Fig. 10

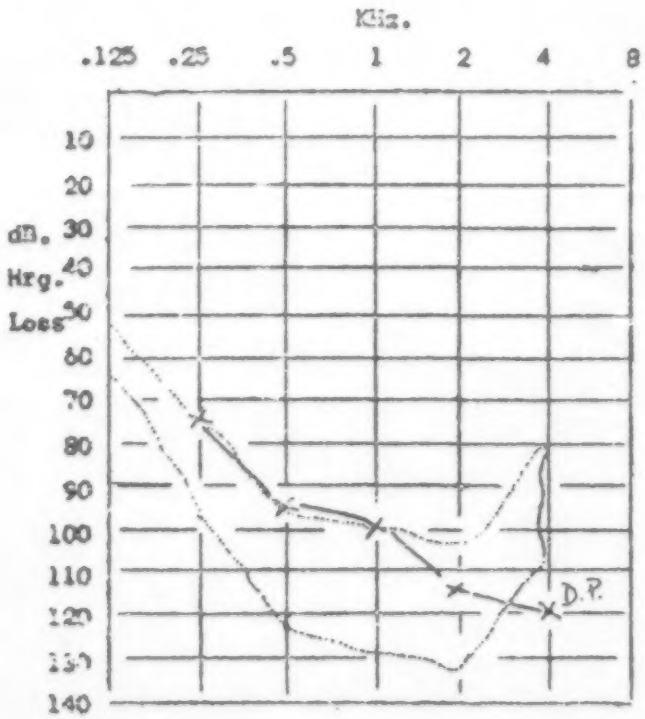

Fig. 11

Theoretical effect of D.P's wearing a range of commercial aids.

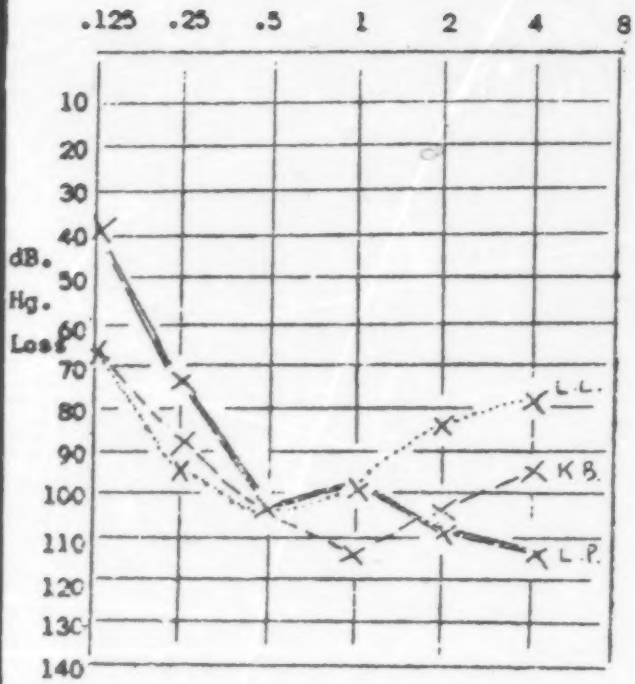

Fig. 12
Better ear audiograms of L.L., K.B., and L.P. taken in 1967.

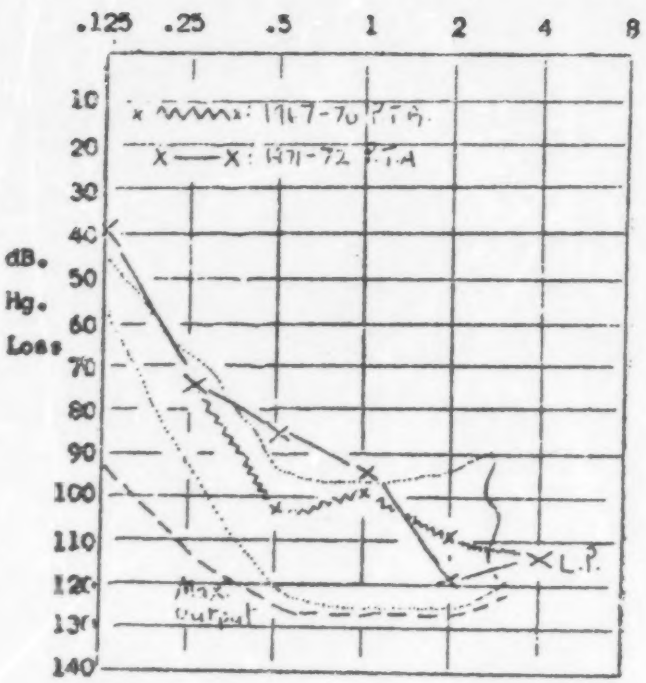

Fig. 13
Theoretical effect of L.P.'s aid.

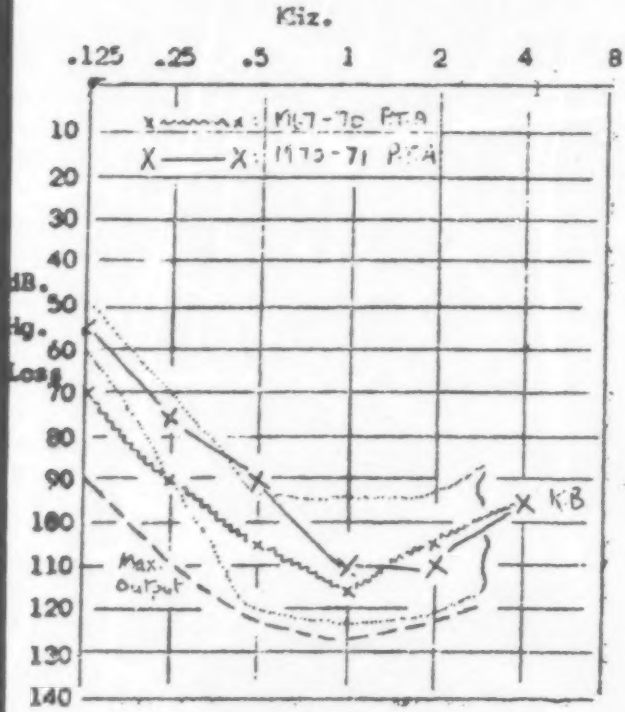

Fig. 14
Theoretical effect of K.B.'s aid.

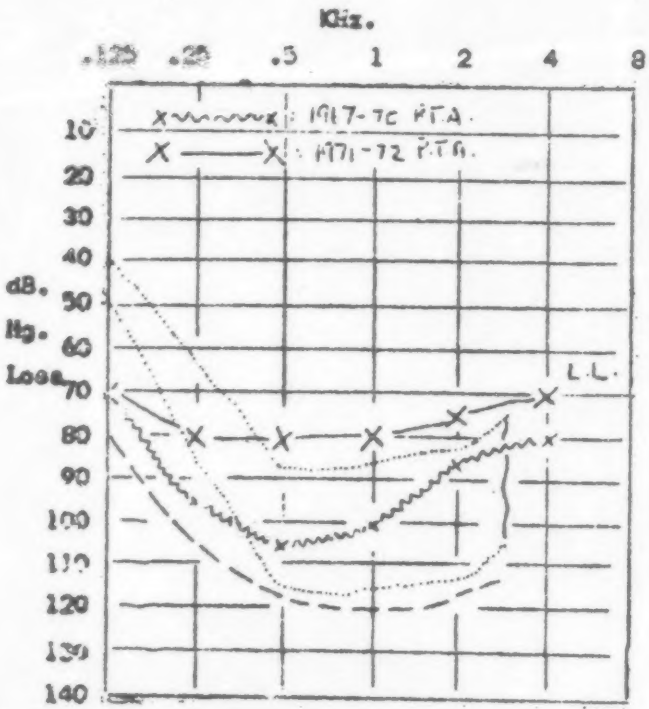

Fig. 15
Theoretical effect of L.L.'s aid.

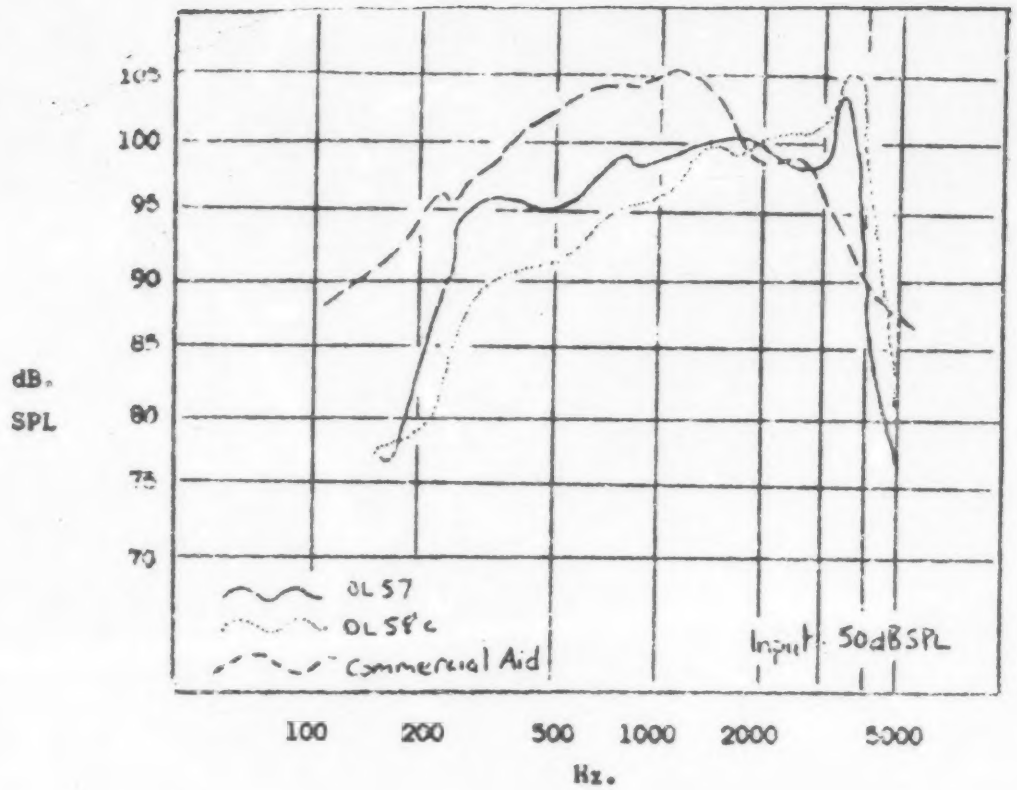

Fig. 16

Comparative responses enjoyed in practice on the three test aids before onset of feedback (curves based on mean gain for all schools at 1KHz.)

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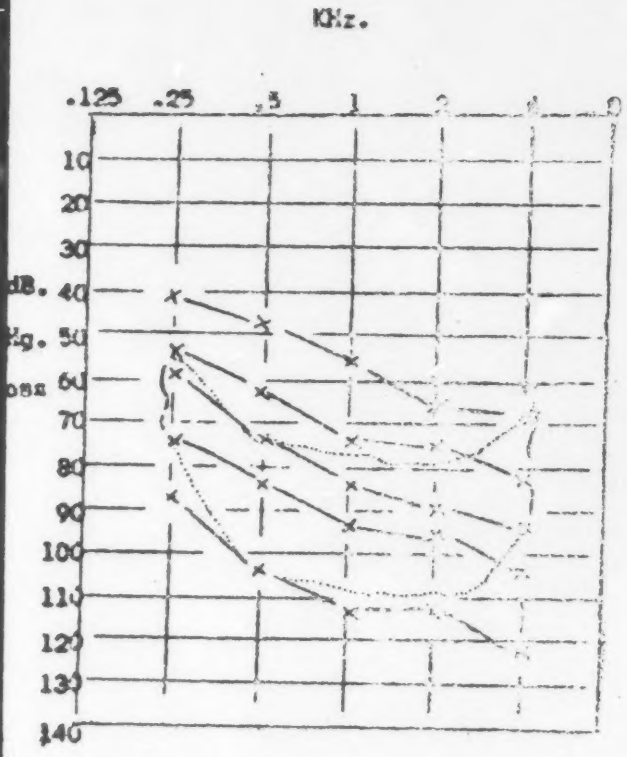

Fig. 17

Five group mean P.T.A.s of 325 ears tested in survey superimposed on Speech Area lowered by effective 1KHz. gain (i.e. before onset of feedback) of OL 57 used in tests.

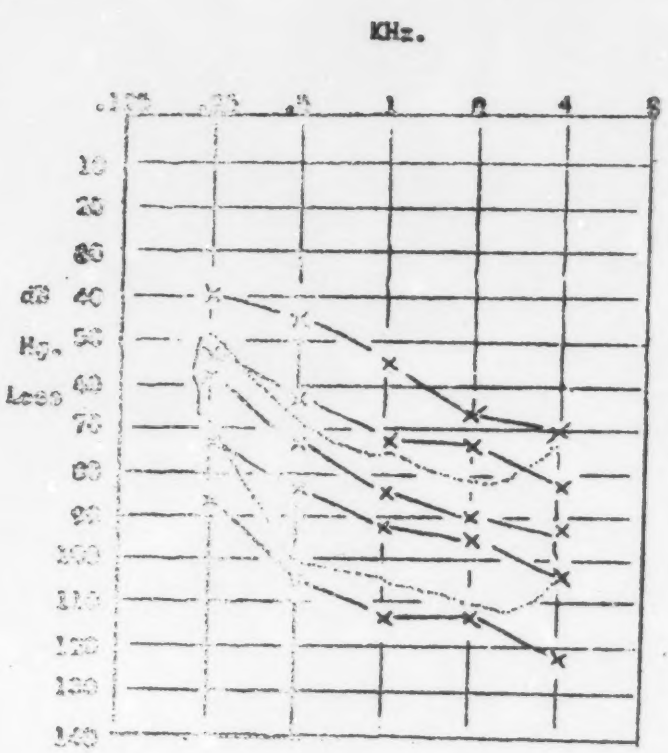

Fig. 18

Five group mean P.T.A.s of 325 ears tested in survey superimposed on Speech Area lowered by effective 1KHz. gain (i.e. before onset of feedback) of OL 58c used in tests

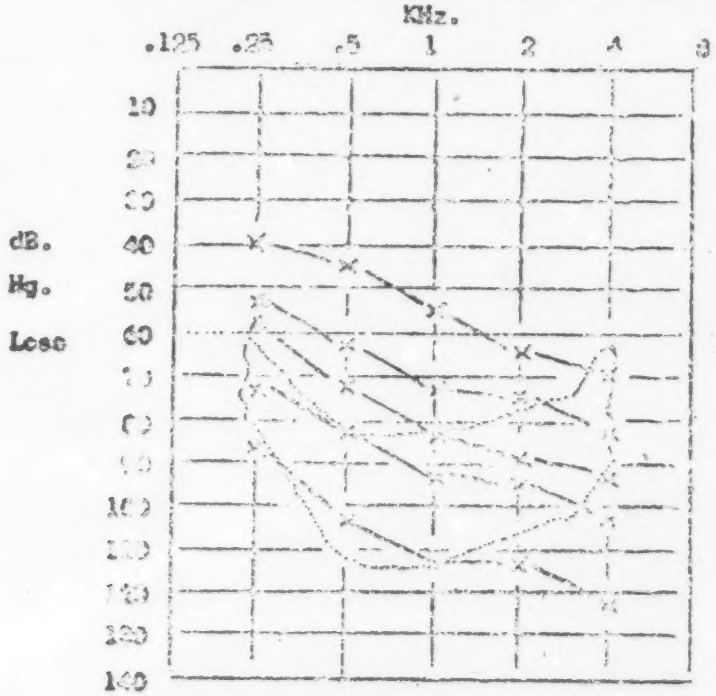

Fig. 19

Five group mean P.T.A.s of 325 ears tested in survey superimposed on Speech Area lowered by effective 2KHz. gain (i.e. before onset of feedback) of experimental aid used in tests.

THE SURVEY OF HEARING AIDS

W. D. Hinc

INTRODUCTION

Since I reported to you last year on the survey of hearing losses we have received information for several hundred more children and the total sample is now 5606 of whom 5334 are in special schools. As the data for the partially hearing units is relatively small, and therefore of unknown reliability, I intend to confine myself to a consideration of our findings with reference to the special schools.

I must once more thank the headteachers and staff of the schools which co-operated in this survey for the work they did in assembling the information on which the survey is based. I think it is appropriate also to recognise the contribution to this survey of Miss Barry, the Department's computer clerk, who punched all the data tapes and the programs used to extract the information from them. I would also like to acknowledge my debt to my colleague Mr. Huntington for his help with reference to lowered speech areas.

Hearing Aids in Use

The bar in Figure 1 represents the 5334 children in special schools. We had no information about the hearing aids of 137 of these (i.e. 2.57 per cent of cases). About two thirds of all the children had one hearing aid only (3634 = 68.13 per cent). About one in nine had a single hearing aid with a Y-lead (583 = 10.93 per cent) and about one in five had two hearing aids (980 = 18.37 per cent) though we cannot necessarily conclude that these two aids were both worn.

There were altogether 91 different models of aid in use. Figure 2 is a graph which shows the distribution of these 91 models according to their percentage of the total number of aids in use. The most common aid (the Medresco OL 57) made up some 42 per cent of the 6177 aids, while the next most common aid constituted about 12 per cent of the total. There were three aids with a frequency of around 6 per cent and a further 9 aids with a frequency in excess of one per cent. It seems that a relatively small number of models of aid make up the vast majority in use. Indeed there were 51 different models which occurred in numbers of half a dozen or fewer (i.e. 0.1 per cent or less). While many of these aids will have been in use for some years and may be obsolete or obsolescent there does seem to be a case for some rationalisation of this position.

Figure 3 shows that seven out of ten hearing aids in the special schools were Medrescos. There were seven commercial manufacturers with in excess of one per cent of the aids in the schools, but of these only two firms exceeded 5 per cent.

Figure 4 shows the proportions of the thirteen most popular models. Nearly half of all the aids were OL 56s or OL57s, one in eight were the ear-level OL 67s and about one in fifteen were the high-power Medresco aids (OL 63/ OL 58C). The most common commercial hearing aid model was roughly equal in popularity to the OL 63.

Hearing Aids and Hearing Loss.

One of the aims of the survey was to determine whether the hearing aids worn by children were sufficiently powerful for their degree of hearing-impairment. It was not possible, of course, to devise a computer routine for determining the suitability of a given hearing aid to a given audiogram because this is largely a matter of clinical judgement. Moreover it was clearly not practical to examine the position for each of the 5334 children individually even had the exact characteristics of each aid been known. It was decided therefore to examine the audiograms of children wearing each type of aid as a group in order to compare them with the lowered speech area of a typical example of the appropriate type of aid (Boothroyd 1968, Huntington 1969, Ewing & Ewing 1971). The technique used was to obtain tenth percentile levels for each of the five points (250 to 4KHz) on the better-ear audiograms of children wearing a given aid. The tenth percentile levels for each frequency point were then joined to the corresponding levels at each of the other frequency points to make tenth percentile audiograms. These tenth percentile audiograms in effect divided the audiograms of children wearing a given hearing aid into ten groups according to level. The weakness of the technique is of course a consequence of the fact that audiograms have differing slopes and therefore the majority of actual audiograms do not fall neatly between any pair of tenth percentile audiograms. Nevertheless it is a logical consequence of the method that any steeply sloping audiogram will be balanced by another which is flatter than the average so that the technique enables one at the least to estimate the proportion of cases who would be suitably fitted with a typical aid of the type they were in fact wearing.

The percentile better-ear audiograms for the 2127 children wearing OL 56s or OL 57s exclusively were computed. The most popular receiver in use with the OL 56/57 was the OL 575. The lowered speech area using this receiver with a typical OL 57 is showin in Figure 5. In addition to the speech area the percentiles nearest to the top and bottom of the speech area have been shown. From these it would appear that about 40 per cent of children (i.e. those above the 40th percentile at the top of the speech area) are receiving the full benefit of the O.. 57, a further 40 per cent (between the 40th and 80th percentiles) are receiving some benefit and the remaining 20 per cent are receiving little or no benefit. While it must be kept in mind that these are only approximate figures it does seem disturbing that as many as 20 per cent of children wearing this aid, that is about 425 of the children included in the survey, may be benefitting very little from it. There would seem at the least to be a strong case for further research in this field.

Figure 6 shows the median (that is the average) audiograms for the four types of Medresco aid. It can be seen that on the average the OL 67 ear level aid is being worn by children less deaf than those wearing the OL 56/57 while the OL 58c and OL 63 are worn by the deafer children. This is of course how it should be, but we have already seen that the OL 56/57 appears to be being worn by a significant proportion of children for whom it is not sufficiently powerful. What is the position for the other Medresco aids?

Figure 7 shows the data for the ear-level OL 67. In this case at least 50 per cent of children appear to be obtaining full benefit and a further 40 per cent some benefit. While the position with this aid does seem to be better than that with the 56/57 one must still ask why this relatively low powered aid is being worn by children with losses too great for it to be suitable in view of the fact that more powerful aids are available.

Figures 8 and 9 show the data for the two high-power Medresco aids. These are undoubtedly being worn by the deafest children but from this evidence it appears that quite small proportions (between 10 and 20 per cent) are able to obtain the full benefit from the aid. Nor does the position appear to be much better for some of the popular high-power commercial aids (Figures 10 to 12), although these also are on the average being used by the deafer children.

In general therefore it appears that more powerful aids are being used by deafer children. However there are a number of children wearing each type of aid who should be wearing a more powerful one.

It is obviously important in supplying hearing aids to know roughly how many of each type will be needed. The data that we had suggested a method for estimating these relative proportions. Figure 13 shows the top edges of the speech areas for the three Medresco models OL 67, OL 57 and OL 58c, together with some of the tenth percentile better-ear audiograms for all the 5016 children for whom we had data in special schools. It appears that about 20 per cent of special school children would obtain full benefit from the ear-level OL 67, a further 15 to 20 per cent would obtain full benefit ffom the OL 58c. Of the remaining 50 per cent most would obtain some benefit from the 58C. Now the figures given here are based on the most common receivers in use for each aid, not the most powerful, and they are also based on an average response for each type of aid. However, taking them at their face value they suggest that some 70 per cent of children in special schools ought to be wearing an OL58c or equivalent high-powered aid, some 15 per cent the OL 57 and some 15 per cent the OL 67. In fact the figures for the OL 67 (12 per cent) are about right but the data of Figures 5 and 7 suggest that it is not altogether the right 12 per cent. Some of those wearing the OL 67 need a more powerful aid while some of those wearing the OL 57 could manage with the OL 67. The proportion of children wearing OL 56/57s (48 per cent) appears to be altogether too large. In fact, the OL 57 would appear to be suitable for a relatively narrow range of children for whom the OL 67 is insufficiently powerful and the OL 58c has an excess of power.

Conclusions and Discussion.

The method of analysis I have presented in this paper is open to many criticisms. Firstly, it is based on a technique of averaging groups of audiograms which is unsatisfactory in that it cannot take account of the slopes of the audiograms. Secondly, the speech areas are ones derived from typical aids of the type. Individual hearing aids may in fact be considerably more powerful than the average, though of course these will be balanced by other individual aids which are less powerful than the average. If these aids were individually assessed and assigned to a child with a suitable audiogram the position would look rather better than it has been painted by the technique of resorting to averages. However, the method of individually assessing aids in order that the right aid may go to each child is rarely practised in this country, so that it seems that the figures presented here are probably not far from the truth. A clear prima facie case

has been made out to suggest that in a disturbingly large number of cases children are not wearing aids sufficiently powerful to meet their hearing loss levels. What is needed now is a more intense study of a relatively small number of children to examine the characteristics of the aid the child is actually wearing against that child's audiogram.

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Ewing, A. W. G. and Ewing, E.C. (1971) Hearing-impaired children under five. London : Manchester University Press

Huntington, A. (1969) The Medresco OL 63. Teacher of the Deaf, 67, 305-313.

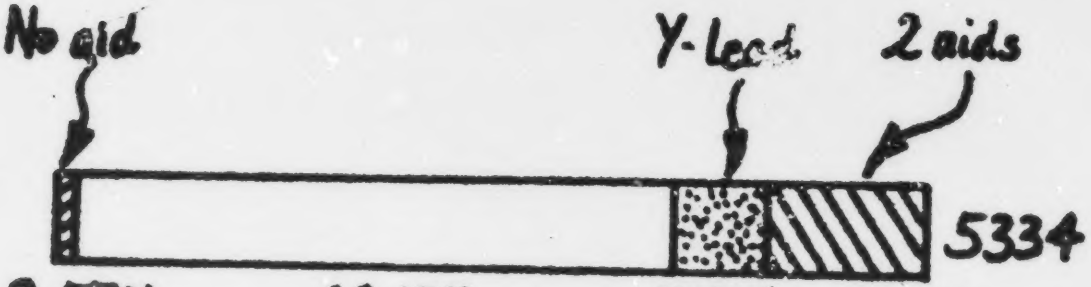
No aid
Y-lead
2 aids
5334
2·57%
127
68·13%
3634
10·93%
583
18·37%
980

Fig. 1

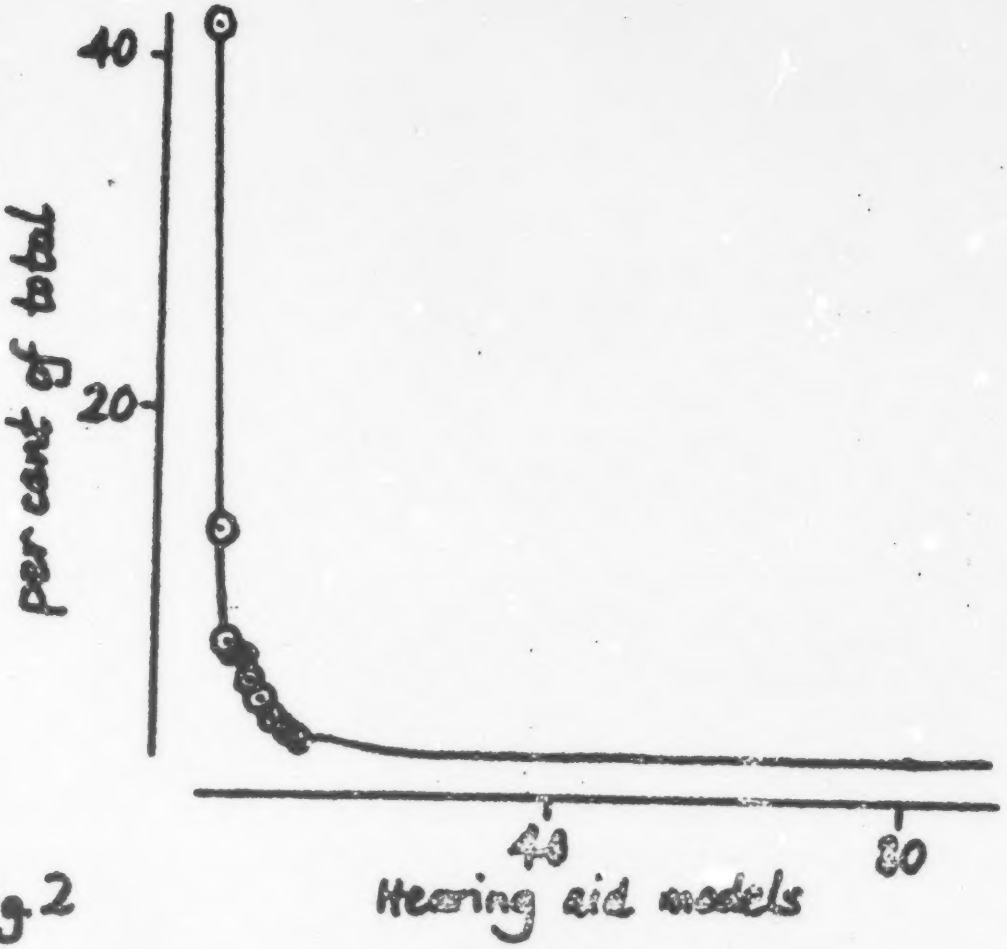
40
20
per cent of total
40
80
Hearing aid models

Fig. 2

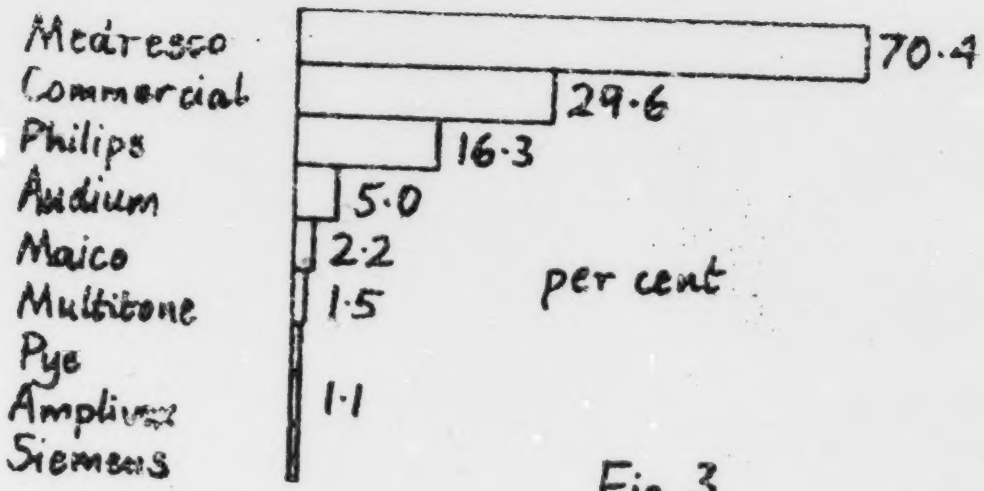
Marconi
Commercial
Philips
Audium
Maico
Multitone
Pye
Amplivox
Siemens
70·4
29·6
16·3
5·0
2·2
1·5
1·1
per cent

Fig. 3

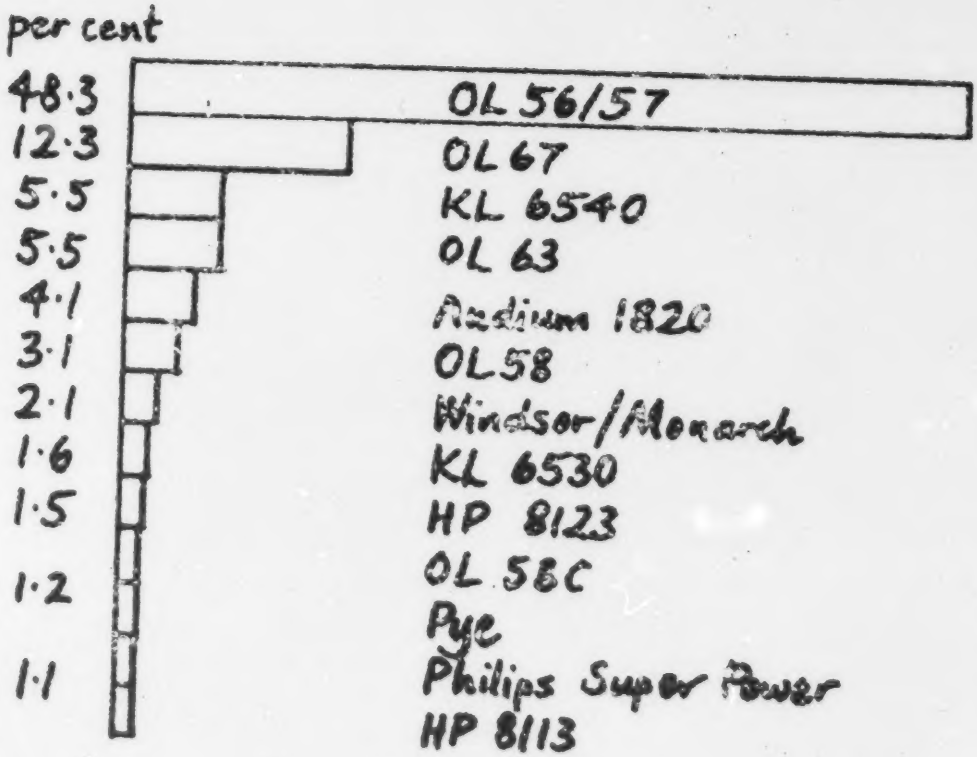
per cent
48·3
12·3
5·5
5·5
4·1
3·1
2·1
1·6
1·5
1·2
1·1
OL 56/57
OL 67
KL 6540
OL 63
Audium 1820
OL 58
Windsor/Monarch
KL 6530
HP 8123
OL 58C
Pye
Philips Super Power
HP 8113

Fig. 4

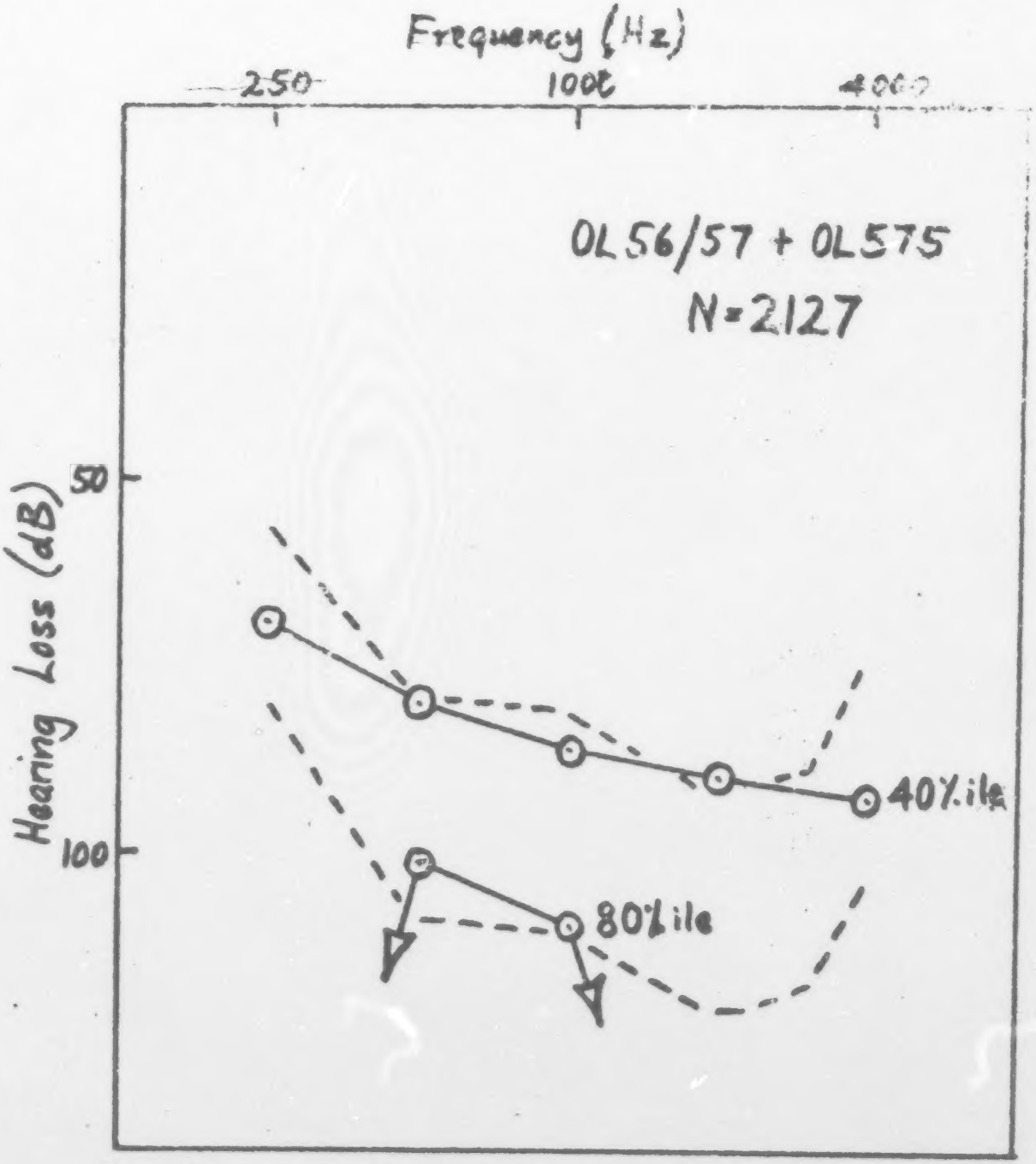
Frequency (Hz)
250
1000
4000
OL56/57 + OL575
N=2127
Hearing Loss (dB)
50
100
40%ile
80%ile

Fig. 5

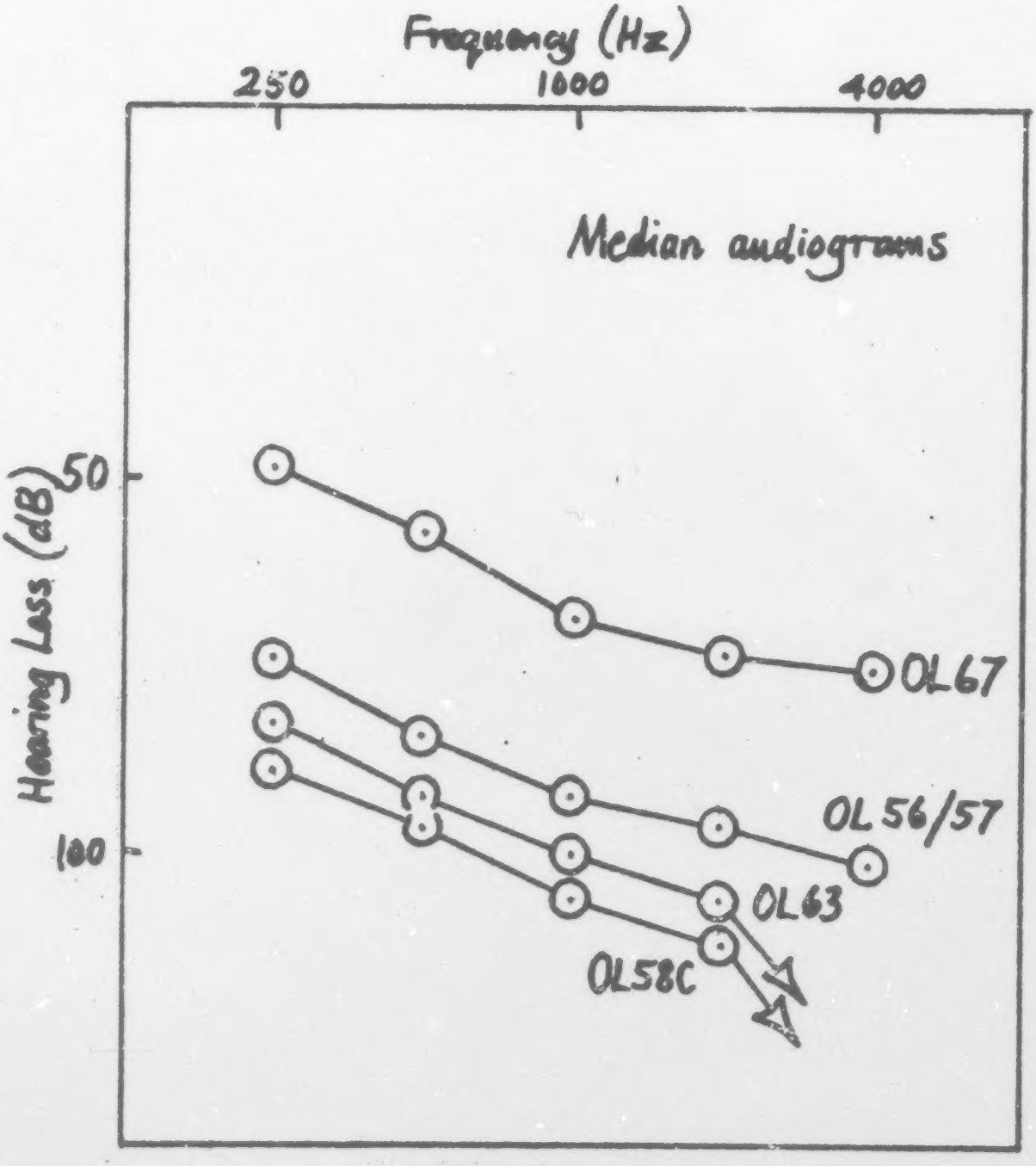
Frequency (Hz)
250
1000
4000
Median audiograms
Hearing Loss (dB)
50
100
OL67
OL56/57
OL63
OL58C

Fig 6

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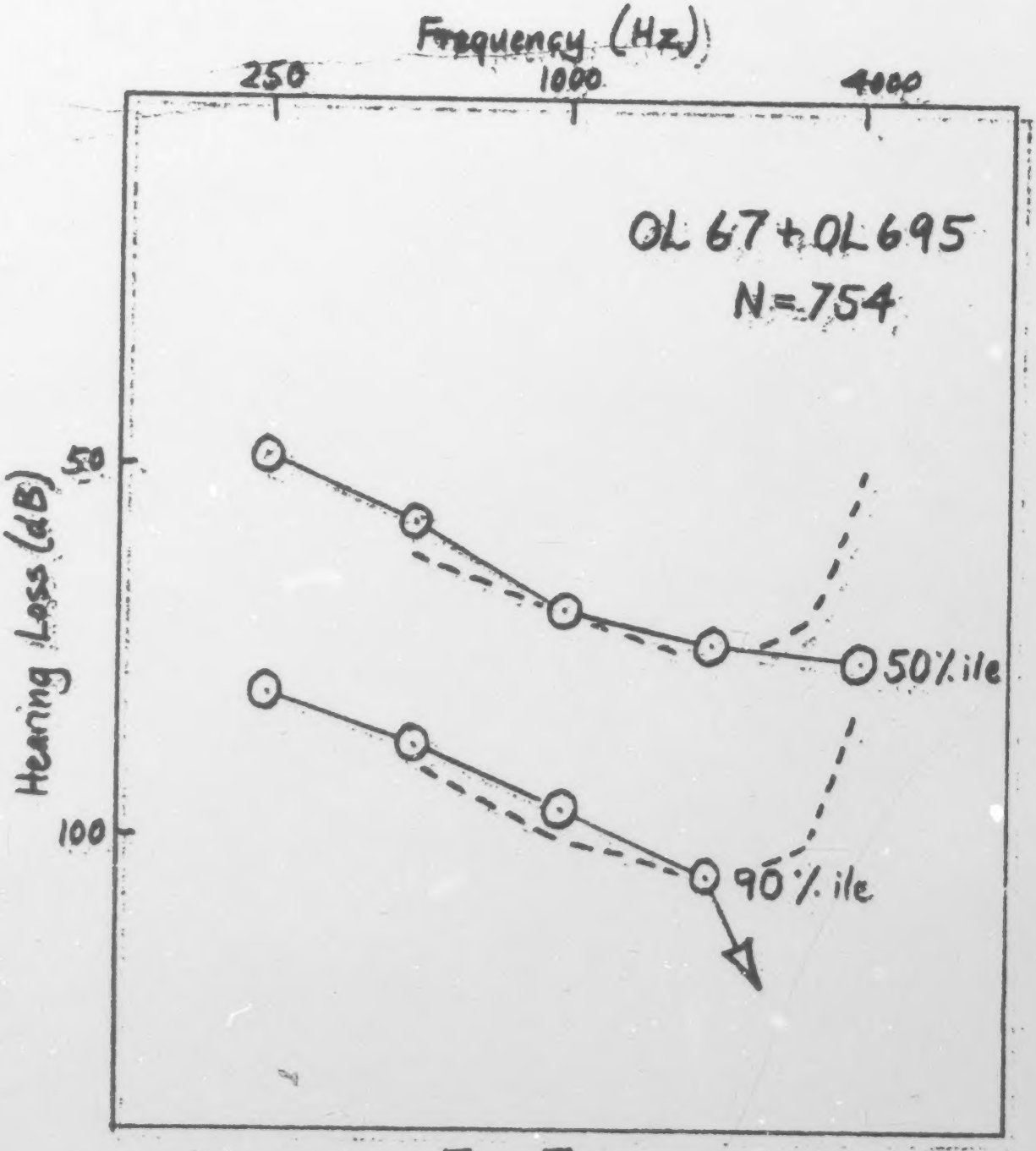

Fig. 7

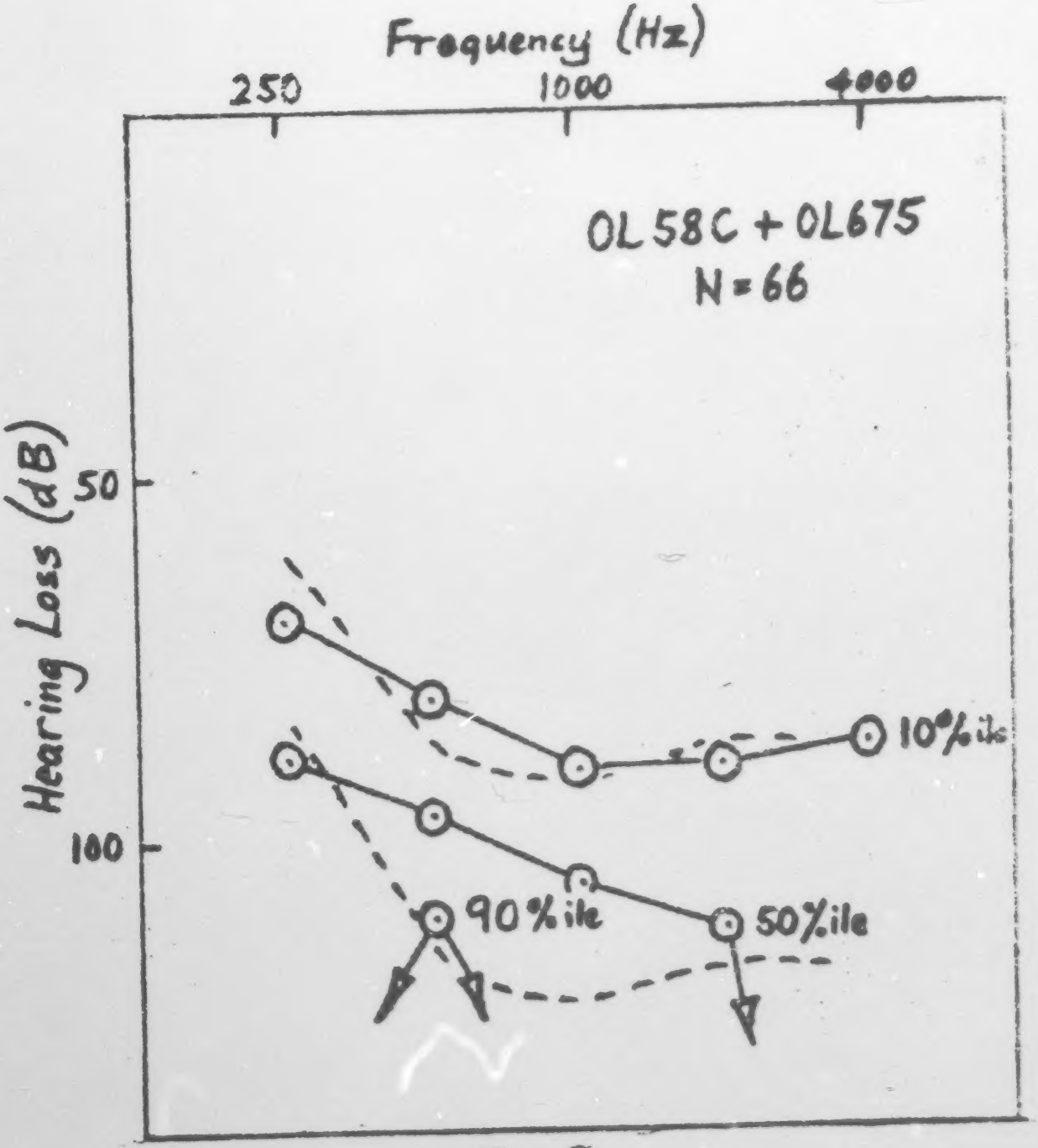
Frequency (Hz)
250
1000
4000
OL58C + OL675
N = 66
Hearing Loss (dB)
50
100
10%ile
90%ile
50%ile

Fig. 8

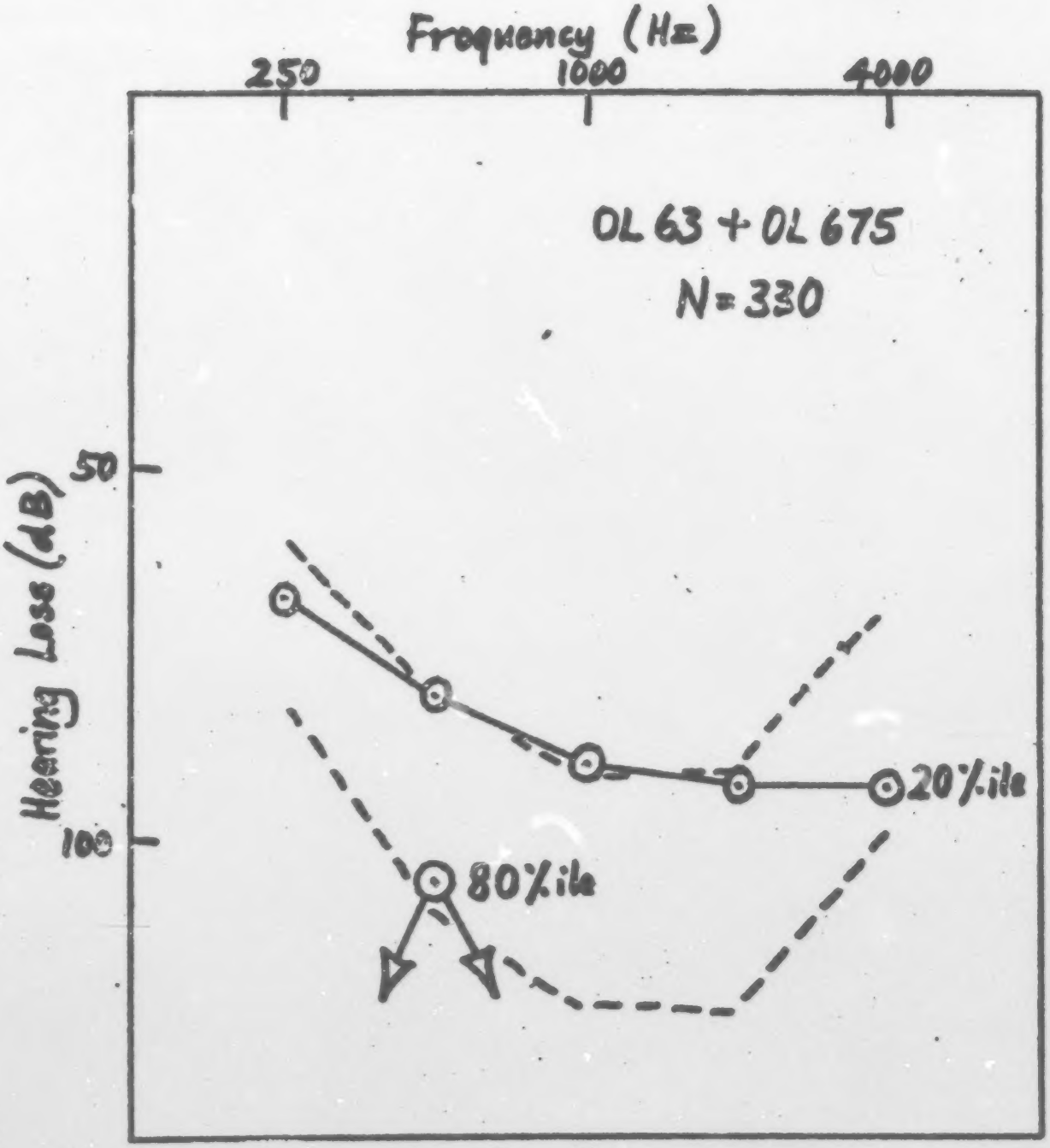
Frequency (Hz)
250
1000
4000
OL 63 + OL 675
N = 330
Hearing Loss (dB)
50
100
20%ile
80%ile

Fig. 9

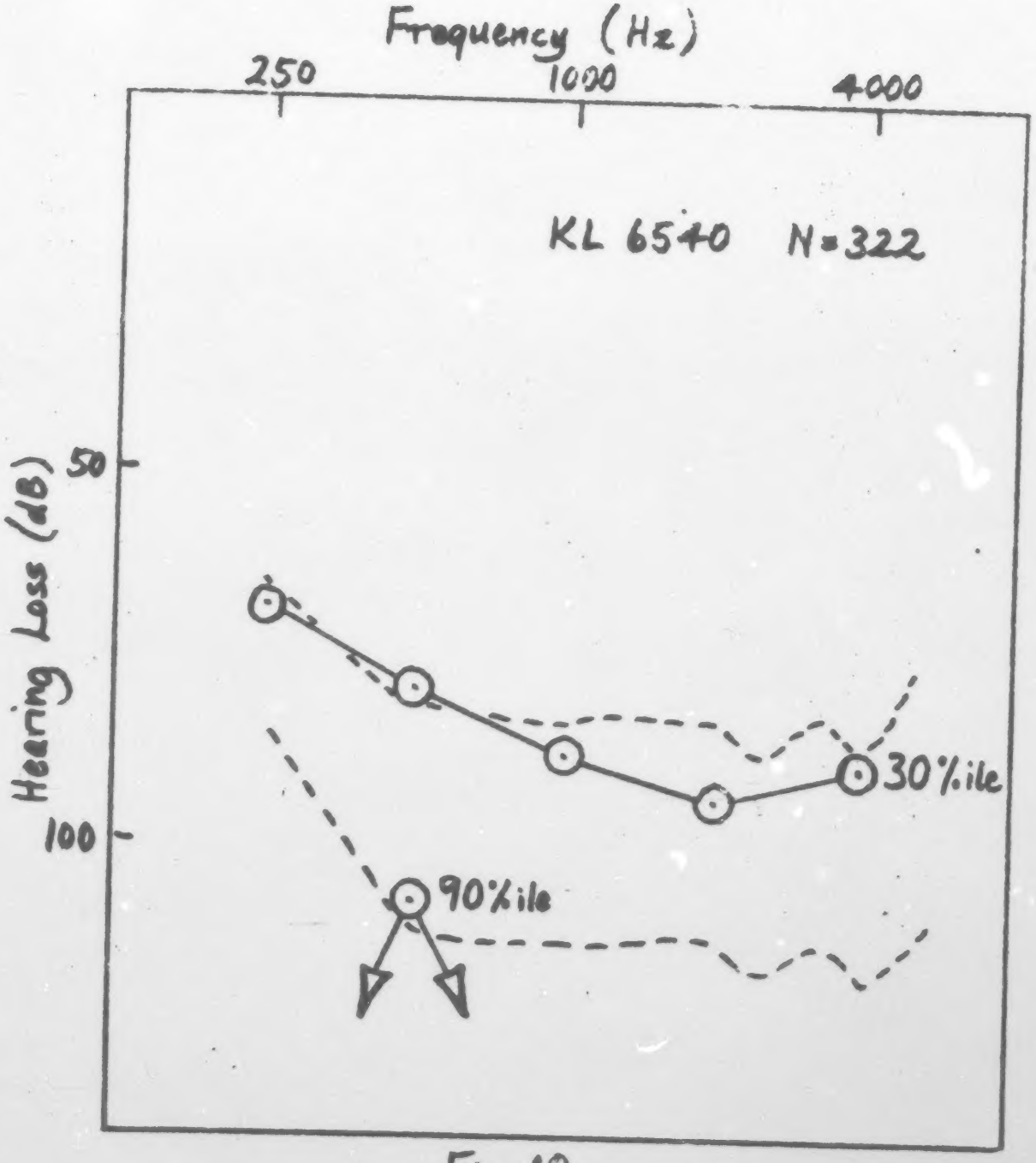
Frequency (Hz)
250
1000
4000
KL 6540 N=322
Hearing Loss (dB)
50
100
30%ile
90%ile

Fig. 10

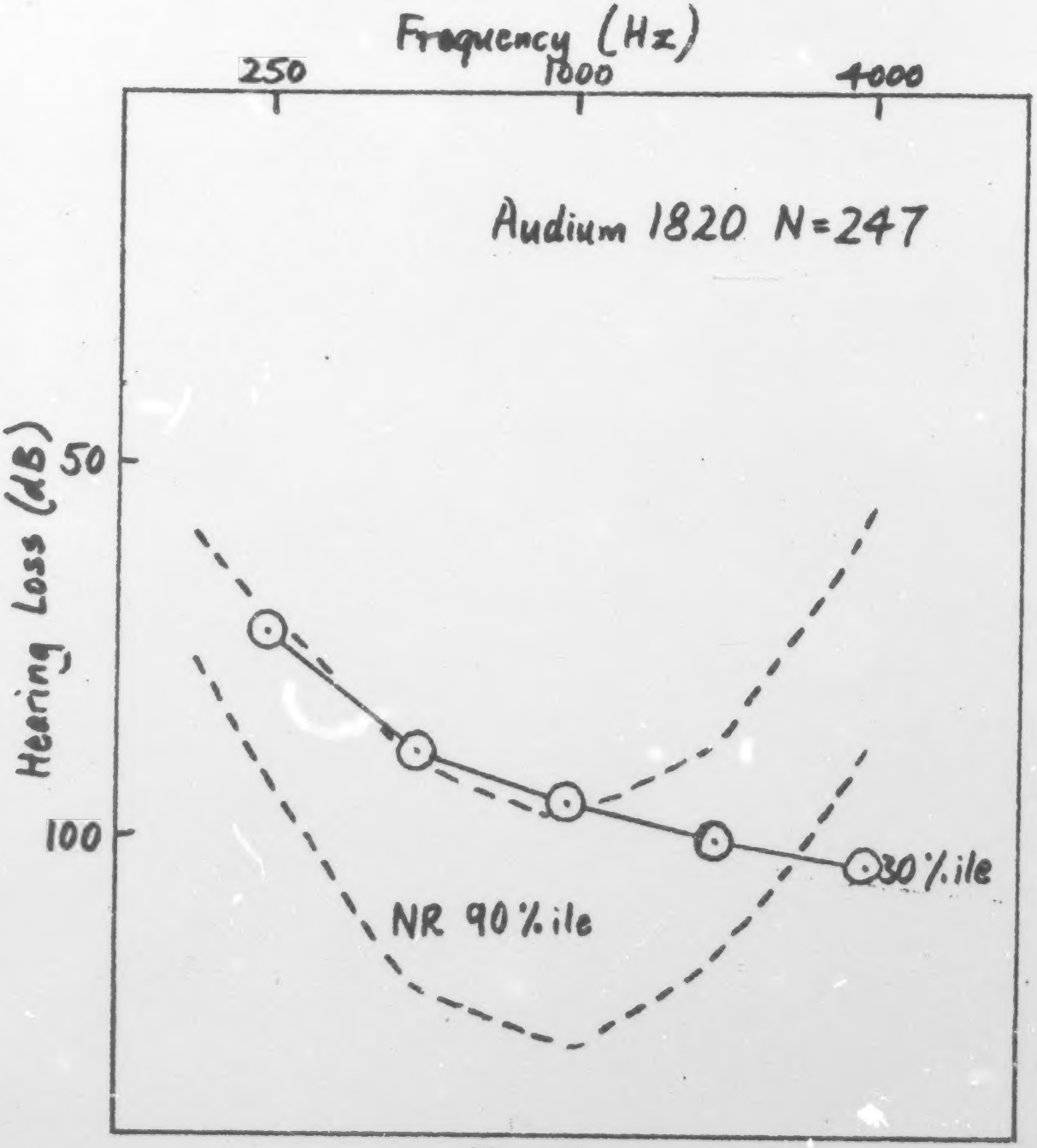
Frequency (Hz)
250
1000
4000
Audium 1820 N=247
Hearing Loss (dB)
50
100
30 %ile
NR 90 %ile

Fig. 11

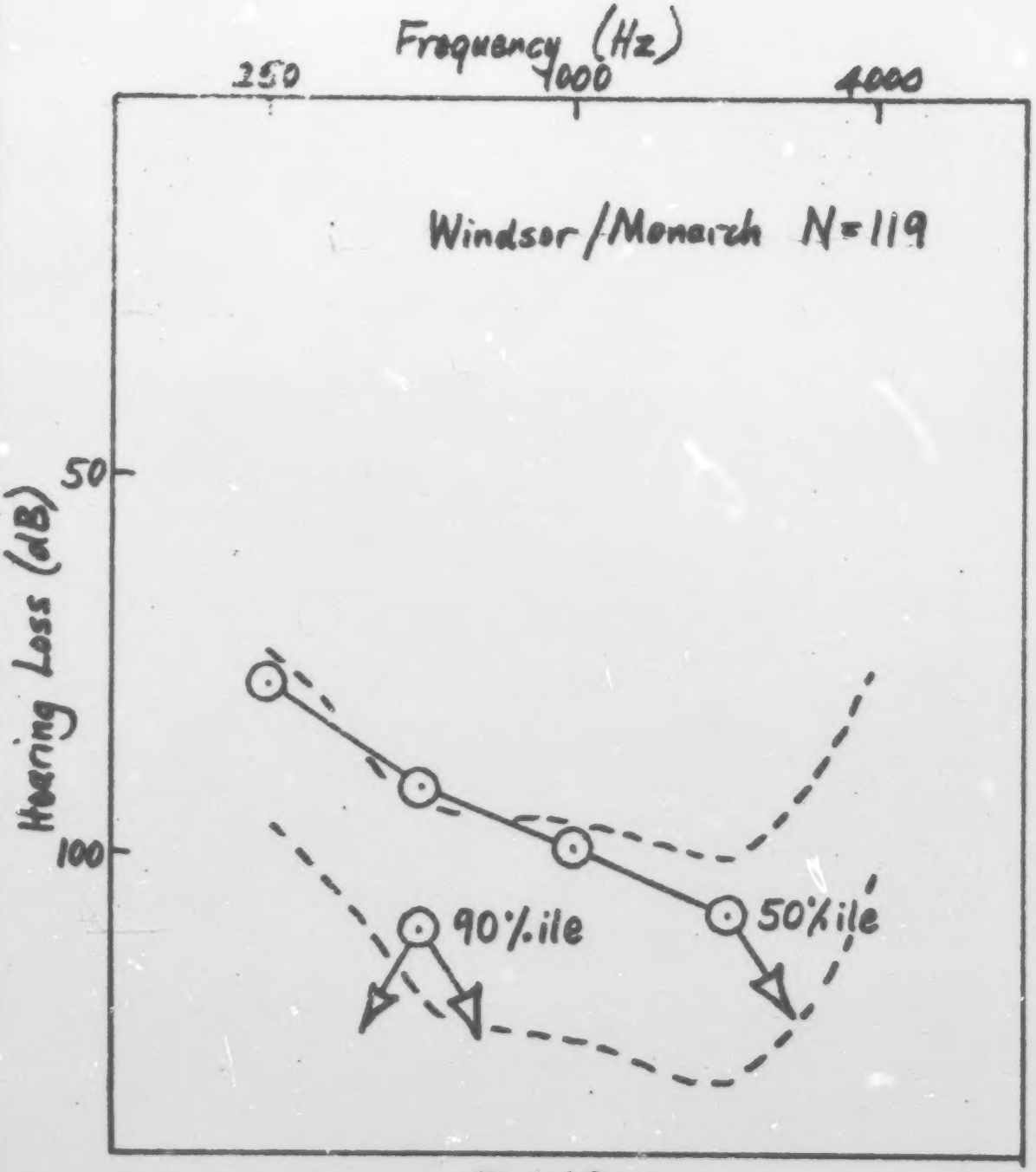
Frequency (Hz)
250
1000
4000
Windsor/Monarch N=119
Hearing Loss (dB)
50
100
90%ile
50%ile

Fig. 12

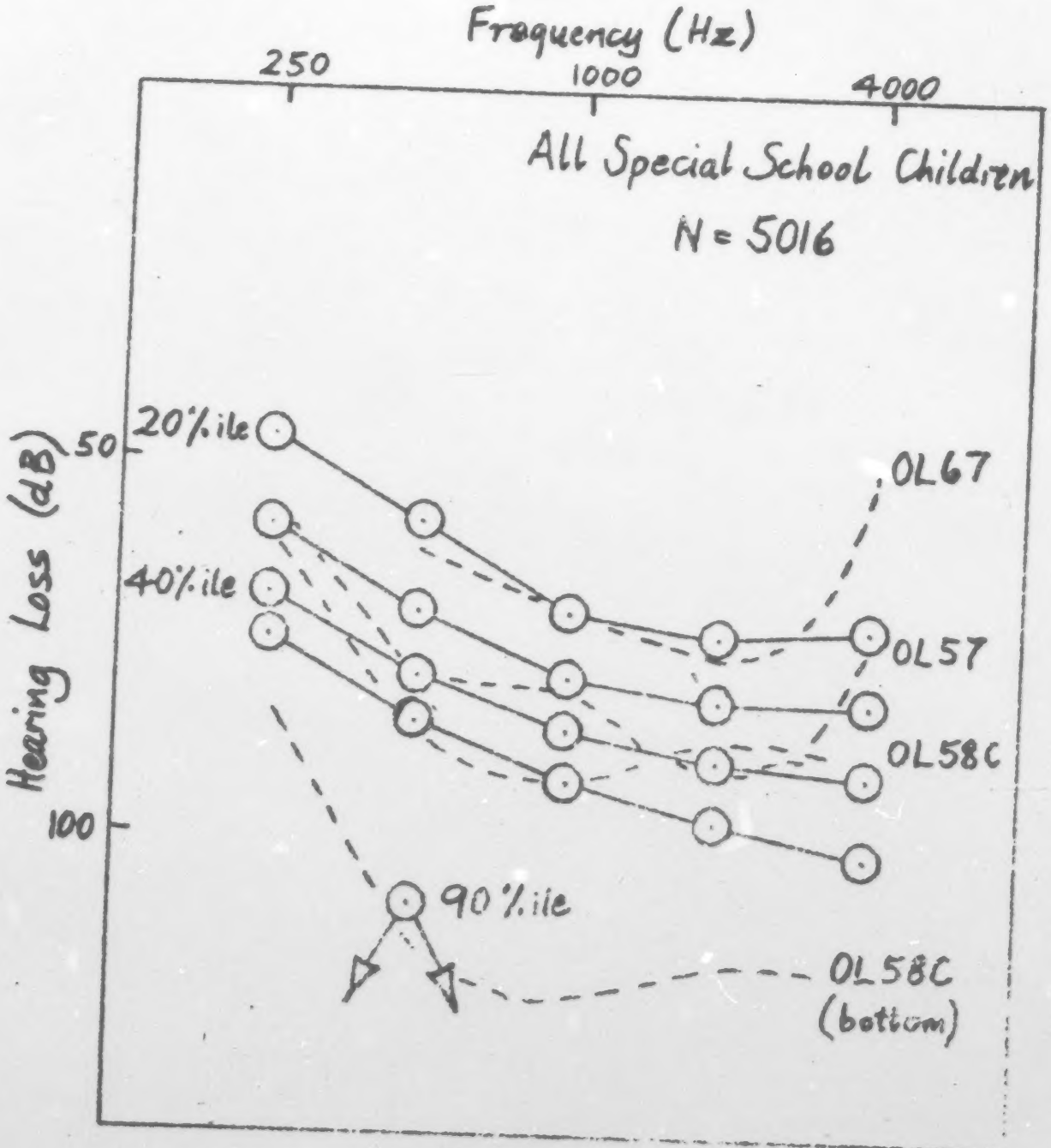
Frequency (Hz)
250
1000
4000
All Special School Children
N = 5016
Hearing Loss (dB)
50
100
20%ile
40%ile
90%ile
OL67
OL57
OL58C
OL58C
(bottom)

Fig. 13

RESEARCH INTO THE TEACHING OF READING TO DEAF CHILDREN

G.W. Redgate

Father Van Uden has stressed, in "A World of Language for Deaf Children" that reading is "important for deaf children..... not only for practical purposes but most of all because the enormous arrears of frequency in receiving language can only be made up by reading. Reading must give them the fund and the ground from which expressive language can grow"

No one would disagree that reading is vital for deaf children, because the written pattern is the only complete and freely accessible form of language which many deaf children are likely to be able to appreciate. Nevertheless, the problem of teaching the great majority of deaf children to read effectively has not been solved yet.

The reading research which is being reported here investigated two important controversial issues in teaching - the use of reading schemes and the initial teaching alphabet - and has also produced interesting evidence about suitable reading tests and rating schedules, as well as revealing relationships between reading attainments and other abilities

The research originated in 1964, experimental work began in 1965 and finished in 1971, and a research report has been produced in 1972.

It is important to remember the length of time taken by this research because many educational ideas have changed considerably since 1964, and some of the decisions made then would certainly have been rather different if present-day knowledge had been available. For example, more attention would have been paid to linguistics and to the choice of reading material for the project.

I must, therefore, recall ideas which were current in education, including education of the deaf, in the early 1960's - ideas which Miss Palmer and I needed to take into consideration when we designed this experiment.

For many years, there had been strong feeling within the professional body of teachers of the deaf that the problems of teaching deaf children to read were so profound and complex that reading books produced for ordinary children were, on the whole, unsuitable for the needs of deaf pupils.

Pleas for consideration of this matter were to be found in the professional journal "The Teacher of the Deaf," and teacher-made schemes have been recorded in this journal. (For example, Callender, 1964).[1] The National College of Teachers of the Deaf had, at one time, sponsored production of a series of readers for deaf children, but after several had been produced, the project had to be discontinued for lack of adequate resources.

Perhaps the most dramatic evidence of the overwhelming opinion of the professional body of teachers of the deaf came in 1966, after the beginning of our project when, at a one-day conference on "Reading and the Hearing-Impaired Child" held by the Midland Branch of the National College of Teachers of the Deaf, 94 teachers of the deaf voted unanimously that the supply of suitable reading books for deaf pupils was inadequate. At this meeting a resolution was passed, as a result of which a sub-committee of teachers of the deaf was set up to produce reading material for deaf children.

On the other hand, in so far as it was possible to interpret "official" opinion in the Ministry of Education, (as it then was), this seemed to be that the necessity for special material had not been proved.

An address was given by Mr. J. Lumsden, H.M.I., a man whose opinions were very much respected, at the Annual General Meeting of the National College of Teachers of the Deaf in March, 1960, in which he reported, with approval, American ideas on the teaching of reading in schools for the deaf. He stated that, on his tour of these schools, he "found the same thing everywhere, the children could read normal books," and referred to reading being "regarded as a separate skill from speaking - you can read though you may not be able to talk articulately," and again "all I can say of the American way is that it works!"[2]

We took into account, also previous research into the reading standards of deaf children in the United Kingdom which had confirmed the very low attainments of deaf pupils in this vital subject.

My own research[3] and that of Miss Palmer[4] had shown this pattern and earlier studies by Gaskill (1952)[5] and Bates (1956)[6] had revealed marked defects in reading attainment even with pupils at the Mary Hare Grammar School.

Amother consideration was the research into i.t.a. done by London University. In 1961, the reading research unit of the Institute of Education of London University had launched an experiment, with the support of the Ministry of Education, in which the initial teaching alphabet was used to teach reading in a number of infant schools in England and its effectiveness was compared with traditional orthography used in a similar group of schools.

Interim reports claimed superiority for the i.t.a. groups in comprehension, accuracy and speed of reading, in spelling and in quality of creative writing.

Criticisms had been made of the experimental design of the London project. Nevertheless, in 1967, after completion of the process of matching experimental and control groups and revision of some of the statistical treatment of the results, the i.t.a. group was claimed to be still superior to the t.o. group in most of the nine main hypotheses tested (Downing,1967)[7]

In 1963, with the encouragement of the then Director of Education for Oldham, the Oldham School for the Deaf became the first school for the deaf in the world, so far as is known, to begin using i.t.a. with deaf children.

We followed the progress of the Oldham project closely and several visits were made to the school to see work being done. The teachers, who were at first sceptical about the advisability of using i.t.a. with deaf children, nevertheless persevered with it, using it only with children who had made a poor start in reading by conventional means or who were non-readers or who had not yet begun to read.

The progress of the i.t.a. group was encouraging and improvements in reading speeds, comprehension and accuracy were reported and, later, improvements in the quality and quantity of creative writing. This was not a controlled experiment, but in view of these results and of the encouraging results reported in using i.t.a. with hearing children, the tentative promise for deaf children of i.t.a. could not be ignored.

It was clearly possible, for instance, that the closer correspondence between grapheme and phoneme in i.t.a. than in t.o. might result in an increase in the rate at which the mechanics of reading were mastered by deaf children using i.t.a., particularly if they were making good use of such residual hearing as they had, with the help of hearing aids. This increased ability, if it did indeed occur, to decode the printed word might increase deaf pupils' appetites for reading, encouraging them to read more material at a faster speed, leading to a greater acquisition of language through reading and finally contributing to further improvements in reading itself.

The foregoing considerations prompted us to design an experiment which, it was hoped, would not only help to decide whether i.t.a. would hold any worthwhile promise as a teaching medium for deaf children but would also provide an opportunity to teach reading systematically using an established reading scheme, thus giving as fair a chance as possible, within the limits of the experimental design, of evaluating the claims of those who maintained that special reading material for deaf children was not necessary.

There were also statistical requirements to consider. In the early 1960's, the Faculty of Education and the School of Education in Manchester strongly favouredexperiments with a fairly large numbers of children, involving careful experimental design and statistical analysis of results. This kind of experimentation, supported by the work of the late Professors Wiseman and Warburton at Manchester, had done much to put educational research on a "scientific" basis. Their contribution to research methods in education was great and the design of our experiment was, of course, influenced by their views.

We were very fortunate in gaining the co-operation of twelve schools for the deaf in the experiment. Without their consistent support throughout four years of work, the project could not have been completed, and we are very grateful to them for their help.

We put forward to the Head Teachers of these schools a plan whereby four schools were to use a particular reading scheme printed in traditional orthography (t.o.) and four more schools were to use the same scheme printed in the initial teaching alphabet (i.t.a.). Four schools were to act as controls, using their own methods and materials, undisturbed by the experimenters

The project was to last for at least three years - in fact, it lasted four years - and children were to be tested each year in reading and results compared at the end of the research.

Of course, considerable preliminary planning and pilot studies needed to be carried out before the main experiment could begin. Most of the first year (1965 - 66) was taken up by this work, parts of which will now be outlined briefly.

As was stated earlier, "official" opinion seemed to suggest that ordinary readers, used systematically, might help to improve reading standards in schools for the deaf. It was certainly true, as my own previous research had shown, that there had been for some years little systematic use of reading schemes in many schools for the deaf. (No criticism of schools is implied here. There were probably good reasons for this situation.)

Our intention was, therefore, to give a fair trial with deaf children, to reading schemes designed for hearing children. Also, we needed to ensure that the reading matter used by the schools in the i.t.a. and t.o. groups of the experiment was similar, to give as fair a comparison as possible of the effects of the two different media on reading ability.

One of our research workers examined fourteen reading schemes, looking at the language used in them, the word load, repetition of vocabulary, print, illustrations and the general appeal of the books to deaf children. She found marked variations from reader to reader. For instance, the maximum number of words in the first reader of one series was 20, the maximum number of new words on any one page was 2, and 18 of the 20 words in the book were repeated more than 10 times throughout the reader. Another first reader had 62 new words in it, with as many as 7 new words on a page, and only 10 of the 62 were repeated more than 10 times.

Finally we were faced with a choice of one of four schemes for the compelling reason that these four were the only ones printed in both i.t.a. and t.o. These schemes were Beacon, Old Lob, Janet and John and McKee. Now, the first three of these schemes were familiar to many teachers and had been in production for a considerable number of years. The McKee scheme had the advantage of being rather new, and its vocabulary control was good compared with almost all other readers surveyed. Moreover, the early McKee readers were

designed to be taught in segments which could usually be related to language activities which the teacher could undertake with her children. The scheme was also accompanied by a very detailed, American-style teacher's manual with copious notes about teaching each page of reading matter, and the approach of the scheme, although mixed look-and-say and phonic, was, it was felt, sufficiently phonic to allow for some exploitation of the phonic possibilities which i.t.a. lends itself to.

The McKee scheme, with all its imperfections, was selected as the reading material least likely to be disadvantageous to deaf children. It is true that it, like most series of readers of the period, portrays a cosy middle-class family, and some of its sentence structures are not completely natural, containing artificial repetitions of words, but such features are not nearly so marked as in many other reading schemes of the time, and it is important to remember that all these readers represented an advance on previous material which had been offered to children.

We did try to ensure some comparability in the way reading was to be taught in the schools in the t.o. and i.t.a. groups, not only by providing similar reading material, but by inviting all participating teachers to Manchester to short residential courses of training consisting of lectures, discussions and workshops. These courses were concerned both with the teaching of the McKee scheme itself and with the relationship between language and reading, with the teaching of language linked to

the reading scheme, and with the teaching of phonics. Copious notes were handed out to teachers at these meetings.

A further reason for holding these courses was to communicate to teachers the purpose and design of the experiment and to ensure that, as far as possible, teachers were equally motivated.

A further safeguard was incorporated to ensure that results could be compared fairly. It was planned to test each year, not only the reading ability of the pupils but other attainments as well, such as number, and receptive and expressive language. The "backwash" effect of testing is well-known and is likely to discourage teachers from being tempted to spend a disproportionate amount of time on the teaching of a subject under study, as a result of an understandable feeling that they want their pupils to do well.

Moreover, we did need to test skills other than reading, in order to look at their relationship with reading.

Other fairly obvious precautions were taken to ensure that results of groups could be compared fairly. We were careful to see that there was a reasonable distribution of day and residential schools in each group and that there was a geographical spread of schools from the south of England to Scotland.

The above-mentioned considerations and many other factors were taken into account in planning the experiment. The final preliminary problem was to decide with which age group of children to begin the project. Eventually, it was resolved to start with pupils aged 5½ to 6½ years as it was at about this age that they might begin to read their first books.

Two difficulties arose here. Because of the internal organisation of schools, it was impossible to confine the sample rigidly to this age range. We had, in fact, to include whole classes whose average age fell in this region. Secondly, to ensure that the 2 to 5½ year olds in the i.t.a. schools were familiar with i.t.a. before they were old enough to join the experimental group, we conducted special i.t.a. conversion courses in these schools for these age groups.

In 1966, our main experiment started, the mean age of entry of the pupils being 6 years 1 month for a sample of 131 children. In 1967, we brought in another group of children as they reached the required age of entry and this gave a further 114 pupils with a mean age of 5 years 8 months. We now had a total sample of 245 deaf pupils (128 boys and 117 girls) representing about 7% of the total number of deaf children of all ages in schools for the deaf and partially hearing in the country at that time. This is, of course, a very adequate size of sample. The social class distribution of this sample seemed satisfactory. We compared it with the Plowden Report's figures for the General Primary School Population and it is similar in most respects.

All the children were tested at the beginning of the experiment and yearly until the end of the project. The tests used are given below.

It was difficult to obtain suitable tests of reading for this age group of deaf children, and after combing Britain and America, we found the Gates - McGinitie Reading Test Primary A, Form 1, which we imported into this country for the first time and the Southgate Group Reading Test 2A. Pilot studies showed that with these two tests, we could obtain a reasonable spread of scores, avoiding the bunching up of scores at the bottom end of many tests used previously with deaf children. These tests were transliterated for administration to the i.t.a. group of children.

Other tests used were as follows:-

(1) Owrid's Oral Language Test (Toy Vocabulary)
This is a test of expressive language in which the subject is required to name orally 25 toys presented one at a time.

(2) Peabody Picture Vocabulary Test, used as a test of receptive language (although it was designed as a test of verbal intelligence) In this test, the subject is required to point to one named object in a set of 4 pictures.

(3) The ability to distinguish shape and to identify similarities and differences in shape is known to be a pre-requisite of learning to read and Daniels and Diack's Visual Discrimination and Orientation Test was used to screen the children in the experiment.

(4) A number test was devised by the research workers as it was not possible to discover a published test which discriminated well enough at the level of attainment reached by most of the children.

(5) It would have been desirable to administer each year, a test of written language, in view of claims made by some researchers that i.t.a. results in improved achievement in creative writing. However, it quickly became clear that very little could be expected of the young children with whom the experiment began and a test of written language was, therefore, administered once only to all pupils, at the end of the experiment, when they were considerably older.

The test given was the Picture Story Language Test devised by Myklebust. The materials for this test consists of a large photograph with clearly visible detail, about which the child being tested has to write a story, after suitable instruction.

(6) During the course of the experiment, a measure of intelligence was obtained from one administration of the Wechsler Intelligence Scale for Children, and a Pure Tone Audiometric Test was given too as a measure of hearing loss.

A comprehensive questionnaire was devised and completed by our research workers containing, for each child, details of educational and medical history, social class, attitude of parents to education and so forth.

Testing the children, individually, occupied two full-time research workers more than a whole term each year and the analysis of results, general administration, meetings with teachers and other liaison work took up their time during the remainder of the year.

We were unfortunate to lose the services of a research worker during the course of the experiment and because of circumstances beyond our control we were unable to secure a replacement for a year. We could not, of course, call a halt to the project and wait for a new appointment to be made but with half our full-time work-force gone, we had to curtail some important activities. For instance, we had held two productive meetings of teachers who were participating in the experiment to discuss specific issues arising from the research. One meeting discussed the good and bad points of the McKee scheme and the other exchanged views about the use of i.t.a. with deaf children. Other meetings which were planned had to be cancelled.

Also, we had to modify our timetable for transferring the i.t.a. group to t.o. We had intended to transfer children individually according to three carefully thought out criteria, namely (1) the reading age of the child

(2) the reading book he had reached

and

(3) the teacher's opinion.

In the event, because of extreme pressure on workers time and because of other difficulties which arose in transferring children individually, all the pupils were transferred to t.o.

in groups during the last year of the experiment and the final reading tests were all given in t.o. after the transition.

Although much of the material accumulated during the course of the research has yet to be analysed, some of the main conclusions can be summarised.

Taking the whole group of children in the experiment and feeding test results and other information from case histories and rating schedules into a correlation matrix, we discovered the following relationships.

a) As might be expected, there was a relatively high correlation between reading attainments and other measures of language ability. This was of the order of .6 or .7 or higher, depending on which of a number of correlations is looked at.

b) If one single predictor of reading success is required, the Peabody Vocabulary Test seems to be the most appropriate. It is interesting that the results of Peabody tests conducted in 1967 and 1968 correlated more highly with reading attainments in 1970, at the end of the experiment, than with reading in 1967 and 1968.

c) The Owrid Oral Language Test was also a good predictor of reading attainment.

d) Other factors, such as general attitude to school work, concentration and persistence, would be expected to influence reading attainment and these traits appear in the matrices to be fairly highly correlated with reading.

e) We found fairly high correlations between number and reading (of the order of .5), and visual discrimination and reading, and these may be due to a degree of verbal mediation which may have facilitated success in the number and visual discrimination tests.

f) Attitudes of father and mother correlated highly significantly with reading attainment after two years for the combined entry groups, and at the end of the experiment for the 1967 entry group. The 1966 entry group did not, peculiarly, show the same pattern although significant associations between parents' attitudes and reading attainments do appear at different stages in the experiment.

Certainly, one would expect that parental support would be important to a deaf child's chances of success in school work over a period of years. This finding tends to emphasise the need, stressed particularly by psychologists and sociologists, to involve parents more closely in the work of the school.

g) The low correlation (r = .068) between reading attainments and pre-school guidance is interesting, especially in view of the importance attached to guidance by professional workers in this field. This finding does not, of course, mean that good pre-school guidance would not be reflected in better reading attainment. It may simply indicate that "parent guidance is frequently orientated in the wrong direction" and that " a scheme of training in all aspects of pre-school work is urgently required." (Department of Education and Science, Education Survey No.6, page 31). It may also indicate that the children who have benefitted greatly from parent guidance are not to be found in schools for the deaf. It is important to note, too, that this finding relates to guidance given to the pupils some years previously. The position with regard to

guidance may not be the same today.

h) Age on admission to school was not shown to be significantly related to attainments in reading (r = .002) This might seem surprising in view of the emphasis placed in some quarters on nursery education. A survey of the function of the nursery school and the role of the nursery school teacher in the education of the deaf might be rewarding.

i) Type of school attendance, whether day or residential, appeared to be little related to reading attainments. This finding may seem to conflict with previous workers' results, where day school education has generally been found to be beneficial to children's progress in language. However, most previous studies of this kind have been made on children's oral language attainments. This finding does, in fact, agree with my own previous research on reading in day and residential schools. Also, the former rigid distinctions between day and residential schooling no longer apply since the system of weekly boarding is now well established in most residential schools for the deaf.

j) Length of experience of teachers did not correlate highly with reading attainments. However, there is clearly no necessarily close connection between experience and quality of teaching although it is often assumed, particularly by teachers, that there is.

k) The low association between the amount of use made of hearing aids at school and reading attainment is noteworthy (r = .074). There is, of course, no certainty that hearing aids were being used effectively by all the children. Previous studies have in fact emphasised that there is considerable room for improvement in the use made of hearing aid equipment in many schools. In 1969, Martin found that more than 50% of Medresco individual aids were not fully working, in a sample of schools for the deaf which he investigated.

1) The correlation matrices showed that hearing loss became more closely associated with reading attainments with increasing length of time, the association becoming highly significant towards the end of the experiment. This evidence is linked with the point made earlier about use of hearing aids. Clearly, use of hearing aids was not compensating for the different degrees of hearing loss of the children in the sample.

A brief analysis and comparison of the reading attainments of the children in the experiment, group by group, will now be given.

There were originally 245 children in the project, 79 in the i.t.a. group, 89 in the t.o. group and 77 in the control group. When the progress of these groups, in terms of their scores on the Gates-McGinitie and Southgate reading tests, was plotted, the t.o. group was shown to have pulled ahead of the other two groups as the experiment progressed.

Results for the 1966 and 1967 entry groups separately showed the same pattern.

However, some initial differences were observed between the groups. There were discrepancies, at the beginning of the experiment, in oral language levels, in the teachers' ratings of understanding and use of speech, and in visual discrimination, which might have affected the issue.

By dropping a number of pupils in order to match the samples more closely on their initial scores, our total numbers were reduced to 207 children overall, comprising 104 boys and 103 girls, with 68 in the i.t.a. group, 69 in the t.o. group and 70 in the control group.

In the 1966 entry sample, the i.t.a. and t.o. groups were now well-matched on all the initial language test results, and for age, intelligence and hearing loss, too.

The reading scores for these groups showed no significant difference during the first three years of the experiment but at the end of the fourth year, there was a significant difference at the 5% level in favour of the t.o. group, after the transition to t.o. by the i.t.a. group of children. It could be argued that the significant difference shown after four years was due entirely to the relative set-back of the i.t.a. children after transition to t.o. - a set-back which has been noted in experiments with hearing children. However, scrutiny of the graphs of mean scores on the language tests for this entry group does not suggest a set-back for the i.t.a. group and indicates that the t.o. group was pulling away from the i.t.a. group in reading even before the transition, although the difference was not statistically significant at that time.

The 1967 entry group was nearly as well-matched as the 1966 sample. There was no significant difference between the i.t.a. and the t.o. groups in age, intelligence, hearing loss or reading, but, initially, there was a slight bias in favour of the t.o. group in oral language. This had, however, disappeared at the end of the first year.

Again, as for the 1966 sample, the same "pulling away" of the t.o. group from the other two groups in reading was noted. Significant differences began to appear after one year in favour of the t.o. group and the difference was highly significant (at the 1% level) after three years instruction.

The scores of the control group in reading, for both the 1966 and the 1967 entry, followed the i.t.a. group scores very closely. In other words, the control group also ended the experiment statistically significantly behind the t.o. group. This is interesting because, of course, the control group was also using traditional orthography but was not using the McKee Readers.

Unfortunately, the control group was not quite as well-matched to the other two groups as we could have wished. It started significantly inferior to one or other of the i.t.a. and t.o. groups in oral language, although it was well-matched on age, hearing loss, intelligence and reading attainment with the other two groups.

Again, however, the "pulling away" of the t.o. group from the control group in reading attainment was noted as the experiment progressed and this was not consistently reflected in the scores on the other language measures.

Bearing in mind the discrepancy in oral language initially, it might be concluded that the controlled approach to reading represented by McKee was advantageous, although this has to be said with caution.

It has, however, already been indicated that the McKee scheme was not thought to provide a good framework for a reading programme for deaf children. It was simply thought to be the least disadvantageous scheme available at the time. If it had been possible to provide a more suitable reading programme, differences in results in favour of the t.o. group might have been even more conclusive than they were.

The reading results achieved by all the children in the experiment cannot be expressed in terms of mean reading ages since some of the pupils did not reach the level of attainment at which they were to be given the Southgate Group Reading Test, Test 2 (Form A), which was the only test whose scores could be translated into reading ages.

However, the percentages of each group reaching a reading age of 7 years or more on the Southgate test by the end of the experiment, by which time the mean age of the pupils was 9 years 4 months, were as follows:-
76% of the t.o. group, 54% of the i.t.a. group and 48% of the control group. These results again indicate the relative superiority of the t.o. group in reading.

Whether our children would have broken through the 8 year reading age "barrier", I do not know. Our graphs were still showing rises in reading ages when the experiment finished. However, Wilkins, one of our research workers, in an independent study of 698 deaf children in 23 schools for the deaf, found that the mean reading age for each age group of deaf children up to 17 years was below 8 years. It would have been interesting to know whether we could have improved conclusively on this record.

The analysis of scores school by school showed that there were probably variations in teacher quality, resulting in performances in reading and Peabody Vocabulary running, in individual classes in schools, counter to the main trends observed in the experimental groups of schools.

There did, however, seem to be enough opposed "cross-currents" revealed in this as yet incomplete analysis not to invalidate the conclusions reached in the analysis of group results.

The analysis of results of individual schools does, however, highlight the importance of teacher quality in the education of deaf children. Since the influence of teachers of the deaf, with their very specialised skills, can be crucial to the success of their pupils, investigation of the attributes of good teachers might be worthwhile.

The relationship between oral language and i.t.a. is interesting. The reading test results for the 1966 and 1967 entries, matched groups, show that the i.t.a. group falls steadily behind the t.o. group as time progresses.

However, the results of the oral language tests do not show this widening of the gap between the groups. In fact, during the course of the experiment, there is a slight narrowing of the gap between the oral language scores of the i.t.a. and t.o. groups.

It will be remembered that the oral language test used in the experiment requires a child to make an oral response which has to be interpreted by the tester. Thus, the greater improvement in oral language attainment, relative to progress in reading, shown by the i.t.a. groups, perhaps lends some support to the subjective opinions of some of the i.t.a. teachers that i.t.a. helped children's speech because of its greater grapheme/phoneme correspondence. This finding might indicate that greater use of signalling systems, on the printed page, which do not involve transfer from one medium to another at a later stage, might be beneficial in speech work with deaf

Nevertheless, it must be stressed that the i.t.a. group's achievements in oral language were not better than the t.o. group's attainments, in absolute terms.

As a result of the findings of this research, three suggestions were made by the workers for possible future action. These suggestions were:-

a) The possibility of devising better, structured reading material for deaf children should be looked into, and in doing this, the association of reading with other forms of language acquisition should be taken into account.

b) The possibility of incorporating a signalling system into any reading material devised, should be investigated.

c) Teacher quality is vital and any improvements which could be made in teaching generally, after suitable research, would be likely to benefit the teaching of reading.

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